



## Original Articles.

### DESTRUCTION OF RATS AS A MEANS FOR THE PREVENTION OF PLAGUE.

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IN the Annual Report of the Sanitary Commissioner with the Government of India recently published, it is stated that experience in Satara indicates that continuous rat-trapping carried out intelligently and with enthusiasm is sufficient to keep a town free from plague. "The method," the Report adds, "is not a cheap one. The cost in Satara amounted to Re. 1 per house per annum. But after all this is not a big price to pay for freedom from plague, and the experience in Satara is well worth the consideration of plague-stricken municipalities."

With all due deference to the highest authority in India on the subject of prevention of disease, I venture to think that it is rather jumping at conclusions to suppose that, because Satara has carried out a systematic rat campaign for some years and has been free from plague, therefore the people of that place have to thank their efforts at destruction of rats for their freedom from this terrible disease. If the Sanitary Commissioner with the Government of India could show that in no single town in India, which had been previously plague-infected, had any recurrence of the disease occurred after systematic destruction of rats had been carried out for some years, I admit there would be considerable force in the argument in favour of rat destruction. If, moreover, it could be shown that, when once a town had become plague-infected and no measures for the destruction of rats had been undertaken, it was invariably attacked again and again, there would be still further support of the view that rat destruction "is sufficient to keep a town free from the disease." Unfortunately, however, there are many instances in which a town has become severely infected with plague, in which no rat destruction on a large scale was undertaken, and yet that town remained free from plague for a number of years in spite of the disease prevailing at many other towns not far distant, and notwithstanding the fact that imported cases had been found again and again in that town. There are instances also in which a town has been severely visited once and only once, and the disease has then vanished. There are cases also in which a town after immunity for a number of years has re-started a violent epidemic, which has followed almost immediately after the importation of a single plague case. The epidemic was, of course, preceded by rat mortality.

In the Annual Sanitary Report for the Central Provinces for 1916, reference is made to the fact that, during the severe plague epidemic in that province, the Saugor town, where systematic destruction of rats was undertaken, remained free. From this I imagine one is to gather that the freedom of this town from the disease is attributed to the fact that the number of rats it normally contained had been considerably reduced. But, on looking at the returns attached to the Report, I find that though plague was raging at Jubbulpore during the month of September, when it is pretty certain that many people must have migrated from that town to the Saugor district, yet no cases occurred in that district till the month of December. It is further interesting to note that the anti-rat campaign at Saugor was commenced in September, and it was not till December, when they had completed the destruction of nearly 17,000 rats, that indigenous cases of plague began to occur in the district. Why, one is naturally inclined to ask, did it not break out at Saugor in September when rats existed in the largest numbers? I note also that not only was Saugor town (where a rat campaign was undertaken) exempt, but that every other town in that district (four of them), and also the cantonments where no anti-rat campaigns were carried out, were entirely free from the disease. The town of Damoh also which is in that part of the Central Provinces recorded no deaths from the disease, and here also no destruction of rats took place. It cannot, I imagine, be argued that the destruction of rats at Saugor town was responsible for the exemption from plague of all the large towns in the northern parts of the Central Provinces. Saugor as well as all these other five towns had during the last ten years or so been visited in turn by outbreaks of plague. And yet, when plague was raging in some other parts of the Central Provinces, and there is practically no doubt that people from infected towns were freely migrating to those northern C. P. towns, practically no outbreak occurred in them. One is naturally inclined then to suppose that there must be some other cause at work to account for the freedom of these towns from plague, and to doubt very much whether the destruction of rats at Saugor had anything whatever to do with it.

Repeated instances occurred in the Central Provinces during the six years that I held the appointment of Inspector-General of Civil Hospitals there, where towns, in spite of endless imported cases of plague from other parts of the province, remained free. Many of these exempt towns had been only a year or so previously the centres of severe epidemics. One is naturally then inclined to ask why these towns, which on previous occasions seemed so prone to become plague-infected, remained free on these occasions.



Now my object in writing this paper is to put before the profession my views on the subject of the efficacy of rat destruction as a means for the prevention of the spread of plague. I do so with considerable diffidence, because I am aware that there are many medical men who thoroughly believe in anti-rat campaigns and pin their faith on them. There are, however, several who, I know, endorse my views on the subject. I am aware that by publishing these views I go counter to a large body of opinion, both professional and otherwise, and I am quite prepared to modify them, or withdraw them altogether, should any who differ with me show me in what respect my reasoning is at fault.

I reproduce below a short note I wrote on the subject in August, 1915. This I wrote because I had repeatedly been asked for my views on rat destruction by commissioners and district officers, but I was careful to explain to them that these were my personal views, that many medical men agreed with them, but that there was a large number who did not. I did not wish to force my individual views down the throats of people who believed that anti-rat campaigns are likely to keep a town free from plague, or discourage this particular method of fighting the disease, because I knew the subject was open to considerable difference of opinion, and we required a good deal more information than was then available before the merits or demerits of anti-rat campaigns could be finally settled.

"The incidence of plague cases among human beings during an outbreak is not dependent on the number of rats in infected areas but on the following conditions:—

(a) the number of fleas on the bodies of the infected rats;

(b) the number of rats that die of plague;

(c) the number of rats that do not die, upon whom the fleas from the dead rats can feed without being forced to feed on man.

"2. It follows then,

(a) that as plague outbreaks by no means exterminate the rat population, the more rats that remain for fleas to feed on the less the chance of fleas from dead rats resorting to man for their food;

(b) that as it is known rats are chronic carriers of the *Pestis Bacillus* and as many of them in areas long infected are known to become immune to the disease, the destruction of large numbers of these, as well as non-immune rats, must result in the fleas being forced to resort to men for food;

(c) that as we have not been able to discover the factor that tends to make the flea so much more prevalent in certain years and seasons than in others, we cannot check the multiplication of this insect at favourable seasons. But it seems reasonable to suppose that the more rats they find to feed on the less the chance of their feeding on human beings.

"3. It is impossible to exterminate the rat population in any large area, and this is especially so in large towns. The total extermination of these animals would probably completely stop plague outbreaks among human beings, but the mere diminution in the number of rats does not reduce the number of outbreaks or their virulence in man. These outbreaks only occur when fleas exist, and these insects only exist at certain seasons. They are much more prevalent in certain years and in certain

places than in others. So long as rat fleas have rats to feed on, they will not attack men.

"4. Systematic rat campaigns have by no means always resulted in preventing plague epidemics. The recent campaign in Nagpur was followed shortly afterwards by a severe epidemic of the disease, and a very large sum of money was spent in the destruction of rats.

"5. The subsidence of a plague outbreak corresponds with the conclusion of the flea season and not with the reduction in the number of rats. In places like Bombay, where the disease is more or less endemic, it is probable that fleas exist at all times of the year. There are always enough rats left after a plague outbreak to keep the disease going in man, if fleas continue to thrive on the bodies of the rats, but unlimited infected rats are harmless if they have no fleas.

"6. Theoretically, the best thing to do during plague outbreaks would be to catch alive as many rats as possible, immunise them by injections of plague prophylactic and then release them. They would then serve the useful purpose of providing food for fleas without infecting such fleas. But the wholesale catching of live rats is almost impossible.

"7. In the Central Provinces, there are two distinct plague seasons, viz., the spring and the autumn. The disease subsides with the onset of the dry hot weather and when the temperature falls very low. This is probably due to the prevalence of fleas in the spring and the autumn and to their absence during the other seasons. A peculiar and almost invariable feature is that areas badly infected in the spring are seldom attacked badly in the following autumn, and areas infected in the autumn seldom show the disease in the following spring. It is difficult to account for this, but it is probably due to the absence of flea infestation oftener than once a year, i.e., fleas' eggs laid in one spring do not ordinarily hatch till the following spring.

"The Central Provinces outbreaks have sometimes been traced to importation from elsewhere, but it is probable that many of them are not due to this cause, and that the disease starts *de novo*, i.e., a certain number of chronic *pestis* carrying rats remain after the last outbreak, and as soon as fleas begin to hatch, these rats act as foci for a fresh outbreak. The fact that during several outbreaks in the neighbourhood of Nagpur imported cases of human plague were discovered repeatedly in the town, but no outbreak occurred, lends support to this theory. On the other hand, a single imported case in several hitherto exempt areas has resulted in the course of a few days in rat mortality, followed almost immediately by plague among the human inhabitants. This is probably due to the fact that the imported case brought with it one or more plague-infected fleas, these fleas attacked the rats in the area, the rats became infected, died in numbers, and left their fleas to feed on man.

"Nagpur, Hoshangabad, and some other places in the Central Provinces were badly infected in the spring of 1915, while Amraoti, Akola, and most towns in the Berars were exempt, in spite of many imported cases. This autumn Nagpur and Hoshangabad have been exempt, notwithstanding many imported cases, while Amraoti and Akola have been visited by severe outbreaks."

I give now three hypothetical cases to illustrate my subsequent remarks. The first is one in which no anti-rat campaign was carried out, the second is one in which an anti-rat campaign was carried out after an epidemic of plague, and the third is one in which anti-rat campaigns were carried out continuously for several years, before, during, and after an epidemic.

CASE I.—No anti-rat campaign.—An area contains 5,000 rats under normal conditions. A plague epizootic

occurs. It is assumed that half the rats in that area die of plague. The area is then left with 2,500 rats, which have to provide food for the fleas of the 5,000 rats. Many of the remaining 2,500 rats have had plague and recovered, and many are probably naturally immune. Assume that the average number of fleas on the original 5,000 rats was 20 per rat. We then have 100,000 fleas to deal with. At the end of epizootic these fleas had only 2,500 rats (all more or less immune) to feed on, giving an average of 40 fleas per rat. These fleas in due course deposit their eggs in cracks, crevices, and corners and then die. The life of a rat flea under favourable conditions is not known for certain, but it is probably not less than two or three months. A year, or, say, nine months later these eggs hatch, the rat population has then again increased to about 5,000, so the flea infestation of the rats would probably remain about the same as it originally was, *viz.*, 20 per rat.

**CASE II—Anti-rat campaign after an epidemic.**—An area contains 5,000 rats under normal conditions. A plague epizootic occurs, half the rats die of plague, leaving only 2,500 rats. An anti-rat campaign is started after the epidemic subsides, and 1,250 rats are killed during the next nine or 12 months, leaving only 1,250 of the old rats (many of which we may assume had become immune) plus another 1,250 that had been born during the 12 months. Total 2,500 rats. Now the flea season begins again and we have only 2,500 rats to feed the fleas that under normal conditions would have had 5,000 rats to feed on. Result is that the 2,500 rats are excessively flea-infested. The plague-carrying rats now infect double the number of fleas they would have infected under normal conditions. Many of these fleas getting transferred to the younger generation of 1,250 rats (none of which are immune), a violent epizootic occurs. The rats that die being excessively flea-infested leave more fleas to find their food elsewhere. The total number of rats being fewer than under normal conditions fail to provide the necessary food for the starving fleas, so the fleas resort more freely to human beings. The result is a severe epidemic of plague.

**CASE III.—Anti-rat campaign carried out continuously for several years, before, during, and after an epidemic.**—An area contains a normal rat population of 5,000. For three years before the epidemic systematic rat destruction was carried out. 2,500 rats killed annually, leaving 2,500 to breed more rapidly owing to more favourable environments. The result is that there will probably be no large diminution in the normal rat population.

An epizootic now occurs, lasting three months, during which 2,500 rats die of plague. These leave their fleas to feed on other rats, or, failing which, on man. Result is all remaining rats are excessively flea-infested. These fleas in due course deposit their eggs and die. A year later the flea season recommences, rats are below the normal in number owing to systematic rat destruction, and the result is they are excessively flea-infested. The infected fleas on the bodies of plague-carrying rats now attack the new generation of rats, which are already excessively flea-infested. Result, violent epizootic followed by plague epidemic.

There is probably a limit to the number of fleas a single rat can harbour, because when they exceed a certain number the rat is able to kill off the surplus. Certain portions of a rat's body, such as the head, neck, and ears, afford a safe resting place for rat fleas.

It may be presumed that the rat population of an area remains at a fairly fixed standard under normal conditions, the number depending on the environments, the opportunities for obtaining food, etc. Any excess over the normal or fixed standard is counteracted by starvation, destruction of the young by the males, and migration to more

favourable environments. Rats under abnormal conditions, such as excess population, starvation, etc., are apt to destroy each other. Hence there is a more or less fixed or normal standard in all areas which does not vary greatly under normal conditions. As regards the notorious fecundity of the common house-rat (*Mus Rattus*), I might mention that some years ago, after a severe plague epidemic at Peshawar, I procured a pair of tame white rats with the object of ascertaining what they could do in the way of procreating their species, and how quickly they could do it, under the most favourable as well as under unfavourable circumstances. Unfortunately the notes I made at the time have been lost, so I can only mention a few points as far as I can remember them. I kept the rats in a large roomy box-cage, with an upper and lower storey to which they gained access by a little ladder. I fed them very handsomely indeed and disturbed them as little as possible. The period of gestation was, I think, 14 days. At the age of six weeks all the first lot of young does were pregnant, and at two months of age had become mothers. The average number of young rats per litter was six. When the cage had become considerably overcrowded by this rapid multiplication, I considerably reduced the food supply. The result was much fighting and killing of each other by the bucks, promiscuous killing and even eating of the young by both bucks and does—in fact, a general state of chaos prevailed in a cage that had formerly been all harmony and prosperity. One need, then, only contemplate from the facts I have witnessed myself what the offspring of a single pair of *Mus Rattus* would be in one year in a wild state under favourable circumstances. It gives one an idea of how hopeless it is to entertain the least idea of exterminating the rat population of a town by anti-rat campaigns, and it also shows how overcrowding under unfavourable environments tends to produce its own cure and a general levelling down to the normal. I have freely used the words "normal rat population" in this article, because I am convinced it has a very real existence, and is an important factor with which we have to deal.

The flea seasons vary greatly in different parts of India. In some places fleas are present more or less all the year round, in others they are conspicuous by their absence except at certain seasons. All dog owners must have noticed this. There is very little difference between the dog flea and the rat flea except in their choice of food.

Where chronic flea infestation is found plague becomes endemic, where seasonal infestation occurs there epidemic plague occurs.

Experiments and experience at Bombay go to show that in endemic areas large numbers of rats become immune to plague, and their

destruction therefore is obviously most undesirable, because they provide food for fleas that leave the bodies of rats dying of plague and these fleas do not again become re-infected so long as they remain on an immune rat.

After an epizootic it is probable numbers of rats that have not died of plague remain as chronic plague bacillus carriers. As soon as the flea season commences these rats act as foci for further spread of the disease. But these plague-carrying rats are harmless so long as they are free from fleas.

Nobody can deny that a localized area, such as, say, a jail, a lunatic asylum, a school, or even a small village at a distance from others, could, if an anti-rat campaign be vigorously prosecuted, be entirely freed from rats temporarily, and so long as it remained free from rats no plague epidemic could possibly occur. The rat fleas in such areas, when hatched, in due season, might resort to human beings for food, but would do no harm. But human blood not being their normal food the probability is they would gradually die out, and so long as no infected rats or rat fleas were re-introduced such areas would remain entirely free from plague, no matter how violently the disease might prevail in the neighbourhood. But it is useless to try and argue that even the most vigorously conducted anti-rat campaign, carried on over a period of several years, could keep a large town or village entirely free from rats. Even if a town could be entirely freed from rats for a time, it could never be kept so for long, because rats are noted for their migrating tendencies. Where there is a demand there will be a supply. If a town offers favourable environments rats will be there. The fewer the rats the more they will find to feed on, the less will be the fighting and destruction among themselves, and the more rapidly will they multiply.

Now I would ask any strong advocate of anti-rat campaigns to explain exactly in what manner he considers a mere diminution in the normal rat population in any given area could reduce the number of plague epidemics, their virulence, or the spread of the disease once it has been established. It may be argued that if the rats are fewer than the normal there is less chance during an epizootic of their dying in human habitations and leaving their fleas to feed on man. But it is unfortunately an established fact that plague rats seldom elect to die quietly and unseen in their holes, and that they prefer to do so publicly and with much ostentation anywhere but in their holes. The fact, then, of rats being fewer than the normal will not prevent those that get plague selecting human habitations for their death-beds.

It may be argued further that rats being few those that die of plague will leave fewer fleas to find their food elsewhere. But I have tried to

show that if the rat population is below the normal those that do exist will be more flea-infested than if an area had a normal rat population, and owing to scarcity of rats the fleas from the dead rats will be more likely to attack man.

But for argument's sake let us assume that I am wrong in thinking that when a rat population is below the normal there will be a greater flea infestation of rats that do exist. Let us suppose that flea-infestation of rats tends to assume a fixed standard, no matter what the number of rats may be. I would then ask the advocate of anti-rat campaigns how a diminution in the number of rats (assuming that there were no chronic *pestis* carriers among them) could prevent an epizootic occurring among them when they are flea-infested if an infected flea is introduced in their midst.

Then again in towns where the disease has assumed an endemic character there must be many *pestis* carrying rats freely communicating with the immune rats and also with the rising generation of young rats that are fully susceptible to the disease. How is it that in such circumstances epidemic plague is not constantly present? The answer, I think, is obvious. When there are no rat fleas the disease does not spread among rats nor is it communicable to man. The more fleas that exist the greater is the chance of plague spreading from rat to rat and from rat to man. It is then the rat flea, not the rat, that is our real enemy.

At present little is known of the circumstances that favour the multiplication of the flea in certain seasons and in certain years. Nor do we know what it is that causes these insects to suddenly disappear. If some means could be discovered to entirely stop the breeding of fleas there is little doubt plague could be stamped out. Unfortunately we are very far from such a discovery at present, and we are powerless to prevent the breeding of fleas in Indian towns.

"No rat—no plague" is a well-known and rather hackneyed saying that has been quoted again and again by the advocates of anti-rat campaigns to impress on local bodies the necessity for rat destruction. The saying is, after all, but a platitude, and those who quote it seem to overlook the fact that there is a vast difference between no rats in a town and a town in which there has been merely a diminution in the normal number of rats it contains. "No rat fleas—no plague" is, I venture to think, a far truer saying than the one I have quoted above. Guinea-pigs and other small rodents can communicate plague if they are flea-infested.

No rats in an Indian town is, I think most people will admit, an utopian idea incapable of fulfilment, whereas a diminution in the normal number of rats is of course quite possible. Every rat epizootic and every anti-rat campaign causes such a diminution. But I deny that either the

one or the other can satisfactorily be shown to have prevented further outbreaks of plague, lessened their virulence, or their tendency to spread. The important factor that governs the whole question is the prevalence or the absence of flea-infestation of rats. Were this not so, how could one account for the eccentricities and extraordinary behaviour of plague outbreaks? In a town, say, like Nagpur, an outbreak, varying considerably in intensity, occurs at certain seasons almost every year, but not every year. For instance, in the long sad story of plague in this unfortunate town, there have been years in which the disease was absent altogether. The plague-carrying rats, it may be presumed, were there as usual, but the disease failed to appear, in spite of many imported cases from elsewhere. Then, later, the disease breaks out again without any apparent reason—without any trace of importation. I contend there can be only one possible explanation of this, and it is the prevalence of the rat flea. When they are absent the thousands of *pestis* carrying rats are powerless for harm. As soon as the flea begins to hatch, the new generation of rats become infected, and this is shortly followed by an outbreak in man.

Then again take the case of the town of Khandwa in the Central Provinces. This town was very severely visited with plague in the autumn of 1911—so much so that when I visited it with the civil surgeon it was practically evacuated by its inhabitants—a dead city, in fact. The people later gradually returned to it, and the town remained free from any further epidemic for a number of years, notwithstanding many imported cases. The neighbouring town of Burhanpur remained almost entirely exempt while Khandwa was being decimated. Then in 1916 Burhanpur had an outbreak which accounted for 1,681 deaths, while Khandwa had only nine deaths. In neither of these towns had rat destruction taken place on any systematic scale. How can these facts be accounted for but on the theory that it depended entirely on the flea-infestation of rats? The two towns being on the main line of the G. I. P. Railway and in the same district, communication is easy and imported cases must have been frequent. Had anti-rat campaigns been conducted at Burhanpur in 1911, or at Khandwa in 1916, the advocate for rat destruction would have pointed to this as the cause of the remarkable exemption from plague of these two towns. But at neither, as far as I am able to gather, had any systematic rat campaigns been carried out, except, one may say, through the agency of plague itself.

In conclusion, then, I will only repeat what I have mentioned in a roundabout way already. I contend it has never yet been satisfactorily shown that the destruction of rats in an Indian

town either by human agency in the shape of anti-rat campaigns or by nature's method, *viz.*, an epizootic of plague, can prevent the recurrence of an epidemic, its spread, or its virulence. On the other hand, there is some reason for thinking that the mere diminution of the normal number of rats in a town may tend to increase the number of plague cases in man, for the reasons I have already given. In the absence of positive proof that anti-rat campaigns are calculated to lessen the frequency of plague epidemics in towns and their virulence, I contend that the large sums of money spent by some municipalities in conducting such campaigns might have been more profitably utilised in other ways. This statement may, I know, be considered revolutionary by the advocates of anti-rat campaigns. If so, it is for them to show that my reasoning and conclusions are wrong, and to quote their evidence to justify the procedure. I have already said I am quite open to conviction and am ready to withdraw what I have said if it can be shown that I am wrong.

#### OBSERVATIONS ON THREE CASES OF ACTINOMYCOSIS HOMINIS.

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I HAVE recently had under my observation three cases of human actinomycosis in which the organisms in each case were cultivated in a pure state. On referring to the literature on the subject I find that this is an extremely rare affection in India; I consequently feel justified in reporting these cases with a description of the morphological and cultural characters of the organisms separated.

The disease is characterized by the formation of a granulation tissue tumour, in any part of the body, due to the invasion of the affected area by a species of lower fungi, streptothrix, actinomyces or nocardia—which give rise to variously shaped bodies called “grains.” These bodies are found embedded in the affected tissue forming the tumour or escaping free in the discharges from an opening or sinus in the diseased area.

*References.*—It can be affirmed definitely that the occurrence of actinomycosis in human subject is very rare in India, as I find no mention of a single case in the record of the last thirty years; though an allied fungal infection of the foot called mycetoma has been recorded by many eminent workers in India from a long time. The names of Vandyke Carter, Kanthack, Boyce and Surveyor, and Boccaro are so well known that one cannot help referring to them in connection

with fungus disease of the foot in India. This disease in human subject, it seems, was not unknown in India even so early as the time of the Atharvaveda, as we find mention in it of a malady called Pada Valmicum, a peculiar disease of the foot in which the affected part gets swollen and appears as a tumour-like mass and later on begins to discharge a peculiar fluid, the character of which corresponds exactly to that of a mycetoma. This term mycetoma literally means a fungus tumour, and was first used by Vandyke Carter, in 1860, who has done excellent work in connection with fungus disease of the foot in India. He could then distinguish two varieties of grains in the discharges, a black and a yellowish white variety. He, at first, believed that the black and the white varieties are the outcome of the same infection and they appear only in the different stages



of the disease. This presumption was, however, found to be incorrect, as later on it was definitely proved that the variety of mycetoma with black grains belongs to a separate class of higher fungi—hypomyces.

Although there is no mention of cases of human actinomycosis in the Indian records within the last thirty years—a period of which I could make a search for—a very large number of cases has been recorded outside India, and these were investigated by many eminent workers in Europe, Africa, and America.

After going through the references in literature, one could find out easily that there existed a confusion of idea, at least among some of the

observers, as to the definite identity of the two kinds of fungal infection, actinomycosis and white variety of mycetoma. Some of them have gone so far as to say that they are the same infection; others only believed that they are identical in nature. In fact, the grains of actinomyces and white mycetoma resemble in so many points in their morphological and cultural characters that one is quite tempted to form such an opinion. But the recent investigations on streptothrix infection by Petruschky, Schleger, and others in 1913 led to a differentiation of the organisms of the two allied infections. Their investigations were based on experiments upon animals, and they observed that the organisms of white mycetoma could not be transmitted to lower animals from man, whereas the organisms of actinomycosis was pathogenic in cattle and other lower animals, and could be transmitted to them from man. The latter, in fact, is primarily a disease of the lower animals, and its transmission to human beings is regarded as secondary. They have also remarked that the typical astral or ray arrangement of the hyphæ is characteristic of true actinomycotic granule and not of mycetoma. The organism of mycetoma selects the foot and hand, while actinomyces occur in all other parts of the body. With these differentiations, and in the present state of our knowledge, it is quite fair to conclude that the organisms of white mycetoma and actinomycosis, although resembling in many points, are not identical, but belong to a separate species of fungi.

*Dissemination.*—The infection of actinomyces is said to occur in almost all those parts of the body where one expects to find the lesions of tuberculous infection. The cellular tissue of the face and neck, back and upper extremities, thoracic and abdominal viscera, brain and meninges and other serous membranes have all been found affected. In the majority of cases of human actinomycosis, the infection remains localised, and spreads locally only by continuity. In cases of generalised infection, the dissemination of the infective material takes place by the blood vessels, giving rise to metastatic abscesses. This occurs only in the very late phase of the disease.

#### THE CLINICAL REPORT OF THE CASES.

CASE NO. 1.—A. K. D., a Hindu male, aged 28, by occupation a shopkeeper, resident of Jessore. Says that about the middle of September 1915, he first felt a sharp pain on his back in the left scapular region. The pain was shooting in character and extending at times towards the front of the chest. Within three days of the onset of this pain he got fever, intermittent in character, ranging from 100°—104°. He then noticed streaks of blood in his sputum, which continued off and on for about a month. His case was diagnosed by a local medical practitioner as one of pulmonary tuberculosis, and was advised to come to Calcutta for treatment. He next



came under observation of Dr. G. C. Chatterjee, who very kindly communicated to me, afterwards, the clinical signs and symptoms that were present at that stage of his illness. There was no swelling then, a definite dulness was present over the left scapular region, absence of breath-sounds over the affected area, and indefinite friction sounds were heard. The peculiar point Dr. Chatterjee noticed then was the severe lancinating pain in the affected area, which used to keep the patient almost awake at night, a feature which, being quite unusual in a case of pulmonary tuberculosis, rather surprised him a little. He gave the patient a few doses of new tuberculine injections; but with no improvement. At this time there appeared a swelling over the painful area on his back. The fever, swelling, and pain made him worse gradually in spite of the various treatment he received under the hands of many renowned doctors, one of whom opened the mass when it became soft and pointed superficially. The thick, viscid discharge on examination did not show any micro-organism then, but later on, after a week when the discharges were examined for a second time, many small whitish yellow particles like the grains of iodoform could be seen, and these granules on careful examination under the microscope showed the typical arrangement of an actinomycotic grain. The methods of examination and a fully illustrated description of the organism will be given later on.

I would like to note here some of the clinical observations I made on this case for the purpose of arriving at a definite diagnosis, and just to exclude other similar affections.

1. *Blood examination.*—The patient's blood was examined on two occasions, at an interval of a fortnight, with the following results:—

|                     | 1st Examination.     | 2nd Examination.       |
|---------------------|----------------------|------------------------|
| Hæmoglobin          | 58 per cent.         | 48 per cent.           |
| Red blood-cells     | 4,200,000 per c.m.m. | 4,000,000 per c. m. m. |
| White blood-cells   | 24,000 " "           | 28,000 " "             |
| Polymorphonuclears  | 61 per cent.         | 76 per cent.           |
| Lymphocytes         | 30 " "               | 16 " "                 |
| Large mononuclears  | 4 " "                | 4 " "                  |
| Eosinophiles        | 5 " "                | 4 " "                  |
| Abnormal corpuscles | nil                  | nil.                   |
| Coagulation time    | 2 min. 30 sec.       | 2 min. 4 sec.          |

2. *Urin examination.*—Almost normal-albumin, sugar, renal casts and bacteria were absent.

3. *Sputum examination.*—No tubercle bacilli found. No fungi could be detected, only some staphylococci and diplococci found present.

4. *Tuberculin cutis reaction.*—Tuberculin test was applied as per Von Pirquet method with human and bovine old tuberculin. The reaction was found to be negative with both the varieties of tuberculin.

5. *Skiagram.*—There was some suspicion in this case about the affection of the bones of the spinal column and ribs, as most of the surgeons and physicians who treated him before suspected spinal caries and periostitis of the ribs, but, on taking an X-ray photo, no bony lesions could be detected.

6. *Examination of the grains.*—The discharges containing the grains were examined thoroughly. No secondary microbes could be detected. A full description of the character of the grains, morphological and culturable, will be given later on.

CASE No. 2.—R. T. C., Hindu male, aged 21, by occupation a clerk, resident of village Lakshipur, district

Midnapur, came to me for the treatment of a discharging sinus, at the upper and inner part of his right arm. He says that in September 1916, after an exposure in the cold, he got fever and two days after he noticed a painful swelling in his right axillary region. The pain grew so intense in character that he could not move his right arm. He applied some local medicines and the painful swelling subsided in 3 or 4 days' time, leaving only the parts tender on pressure. This tenderness remained there until he had another exposure in the cold on his mother's death, when the tender spot again became painful and swollen and pointed superficially like an abscess, which burst itself on applying hot compresses and began to discharge thin sanious matter. The discharges stopped in 3 or 4 days, but the part remained very tender and painful. He then took admission in a hospital at Midnapur, where the swollen tender mass was opened and the wound was dressed for a time, but there remained a sinus discharging thick pus, and as this continued for a long time, he was advised to come to Calcutta for treatment with autogenous vaccine injections. On coming to Calcutta he came under my observation, and on careful examination he was found to be in good health otherwise, except the discharging sinus in his right arm. On probing the sinus which runs very superficially under the skin for 4 to 5 inches along the inner side of his arm, and on examining the discharges one could recognise with much difficulty the tiny yellowish white granules resembling the minute fish-roe bodies. On further examination under a high power the grains showed the typical structure of actinomycotic granules.

CASE No. 3.—S. N. G., Hindu male, aged 35, by occupation a pleader, resident of village Dadpur, district Midnapur, was admitted in the Campbell Hospital on the 11th April, 1917, by order of the Superintendent for the treatment of suspected spinal abscess in the upper dorsal region.

The patient says that in February 1914, while he was in his native village at Dadpur, he got an attack of fever, and four days after he felt a sudden attack of pain, sharp and shooting in character, on his back over an area situated between the dorsal spinous processes and the middle part of the vertebral border of right scapula. He remained very restless with the pain, a local medical man treated him for pleurisy. He then got an attack of cough and spat chocolate-coloured sputum which took 7 or 8 days to clear. The fever subsided gradually, and there remained slight tenderness in the affected area for a long time. A week after the subsidence of his febrile temperature, he noticed streaks of blood in his sputum, and this frightened him very much, and he came to Calcutta for treatment. To his misfortune he could not get any relief of his trouble in the hands of many notable physicians and surgeons in Calcutta, and at last he took his admission in the Campbell Hospital in the following condition: He was very much emaciated, getting intermittent fever ranging from 99° to 101°, a tender and swollen painful mass on his back, right side; tongue clear and moist, lost many teeth as he had been suffering from gingivitis for a long time. Five of his teeth were found to be loose and gums unhealthy-looking. Appetite dull, complained of acid dyspepsia and obstinate constipation; sleeps badly, memory dull, and mind clear. Liver and spleen not enlarged, glands normal, heart-sounds normal. A few occasional râles could be heard here and there in the lungs. After two days of his admission in the hospital, the tender and swollen part on his back grew in size and pointed superficially like an abscess, which was opened. The discharges were sent to me for examination, culture, and preparation of auto-vaccine. On careful examination of the discharges, no bacteria could be detected, but few tiny yellowish-white

grains were found, which, under the microscope, showed beautifully the structures of an actinomycotic granulo.

I would now like to mention here some of the clinical observations that have been made in this case with a view to exclude other diseases which might give rise to similar signs and symptoms.

1. *Blood examination.*—The patient's blood was examined with the following results:—

|                     |                |                       |
|---------------------|----------------|-----------------------|
| Hæmoglobin          | ...            | 56%                   |
| Red blood-cells     | ...            | 4,800,000 per c. m.m. |
| White blood-cells   | ...            | 16,000 "              |
| Polymorphonuclears  | ...            | 79%                   |
| Lymphocytes         | ...            | 13%                   |
| Large mononuclears  | ...            | 8%                    |
| Eosinophiles        | ...            | 0%                    |
| Abnormal corpuscles | ...            | nil                   |
| Coagulation time    | 2 min. 26 sec. |                       |

2. *Urine examination.*—Specific gravity—1016. Reaction—acid. Sugar and albumin—nil. Renal casts—nil. Calcium oxalate crystals—plenty. Bacteria—many.

3. *Sputum examination.*—No tubercle bacilli found; no fungi could be detected; a few diplococci only were present.

4. *Tuberculin test.*—The test was applied as per Von Pirquet method with human and bovine tuberculin. The test gave negative results with both the varieties.

5. *Skilogram.*—As the patient was admitted on a suspicion of spinal caries, a photo under X-ray was taken, and no bony lesions either in the spinal bones or in the ribs could be detected.

6. *Micro.*—Section of the scraped tissue from the indurated mass: After embedding the scraped tissue in paraffin, micro-sections were made and stained with hæmatoxyline and eosin. The sections showed the presence of granulation tissue and a reniform cross section of a small grain which, under a high power of the microscope, revealed the striated cortex with the radial arrangement of the hyphæ. This of course definitely confirmed the diagnosis of the case as one of granulation tissue tumour caused by the invasion of ray fungi or actinomyces.

8. *Examination of the discharges.*—The discharges contained no bacteria, but small yellowish white grains were present embedded in the pus. The grains on examination under the microscope showed the structure of an actinomycotic granule.

9. The grains were isolated and cultivated in different media in a pure condition. An autogenous vaccine was prepared from the growths in nutrient agar. As the emulsion of the fungi in normal saline could not be made easily I succeeded in making the emulsion quite good with 5 per cent. glycerine in normal saline, and a vaccine was prepared with a strength of 40 million of the fragments per c.c. The optimum for these fungal organisms has been found to be 70°C. With this vaccine the patient had four injections at an interval of five or six days beginning with a dose of 10 million fragments and increasing the dose by 10 million each time reaching up to 40 million. With these injections the patient did not show much in the way of reactions, and as his condition did not improve satisfactorily he left the hospital on his own accord, and thus vaccine treatment could not be continued further.

#### SOME REMARKS ON THE CLINICAL ASPECTS OF THE CASES.

(1) *Cases Nos. 1 and 3.*—The onset in both the cases began with pain in the chest, fever and cough with hæmoptysis—all these point to infection of the lung. There were positive

physical signs of pleurisy present in case No. 1. So evidently the primary infection in these two cases must have passed through the lungs and pleuræ, and the infective foci ultimately shifted to somewhere in the back part of the chest wall affecting the cellular and muscular tissues on the sides of the spine near the inner border of scapula where they actually formed granulomatous tumours. The case No. 3 had many carious teeth and spongy gums—these often afford suitable nidus for the growth of fungi.

*Case No. 2.*—This is a specimen of early infection. The onset in this case began with sudden pain in his right arm. The granuloma developed gradually in the axillary region and spread locally down the inner aspect of the arm. The possible mode of infection in this case may be a slight trauma by some pointed vegetal substance, e.g., a thorn or spine on which these fungi are said to live a parasitic life. Although he came for a course of vaccine treatment he had to go back to his place of work at Midnapur without having had any specific treatment whatsoever. He could only apply hot boric compresses for some time, and I have heard recently from his relatives here that he is now cured of his ailment and has not got any trace of his former troubles; thus, it seems, he recovered by natural means. So one ought to remember and I would lay especial stress on this point, as I am of opinion that mild cases sometimes may get a natural cure.

(2) The cases all began with sharp lancinating pain and fever; cases Nos. 1 and 3 resembled so closely a case of tuberculosis that even the most careful men in the profession failed to detect the true nature of the infection. The definite diagnosis, of course, depends upon the finding of the grains in the discharges and studying their characters under a microscope. It is only at the early stages of the fungal infection when the discharges or excreta are not available and when, by the physical signs and symptoms present, they resemble very closely cases of tuberculosis that the diagnosis becomes a matter of some difficulty, and the following differential points, I consider, are of some value:—

(i) The sharp lancinating pain which keeps the patient awake at night at the onset of the disease is very unusual with cases of tuberculosis in the early stages.

(ii) Presence of a moderate or high leucocytosis as found in cases Nos. 1 and 3 are often absent in uncomplicated cases of tuberculosis.

(iii) A negative tuberculin test as per Von Pirquet method is no doubt a safe guide.

(3) Cases of human actinomycosis in India are no doubt of very rare occurrence, as can be seen from the records; but after coming across three consecutive cases during the space of six months, I am led to think that a more





FIG. 1.

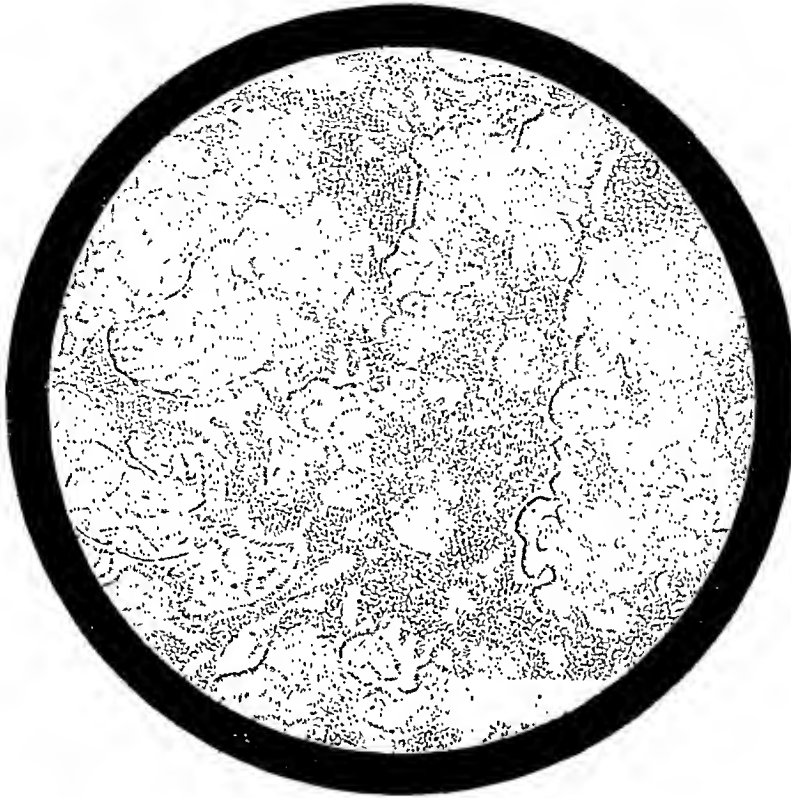


FIG. 2.





FIG. 1.

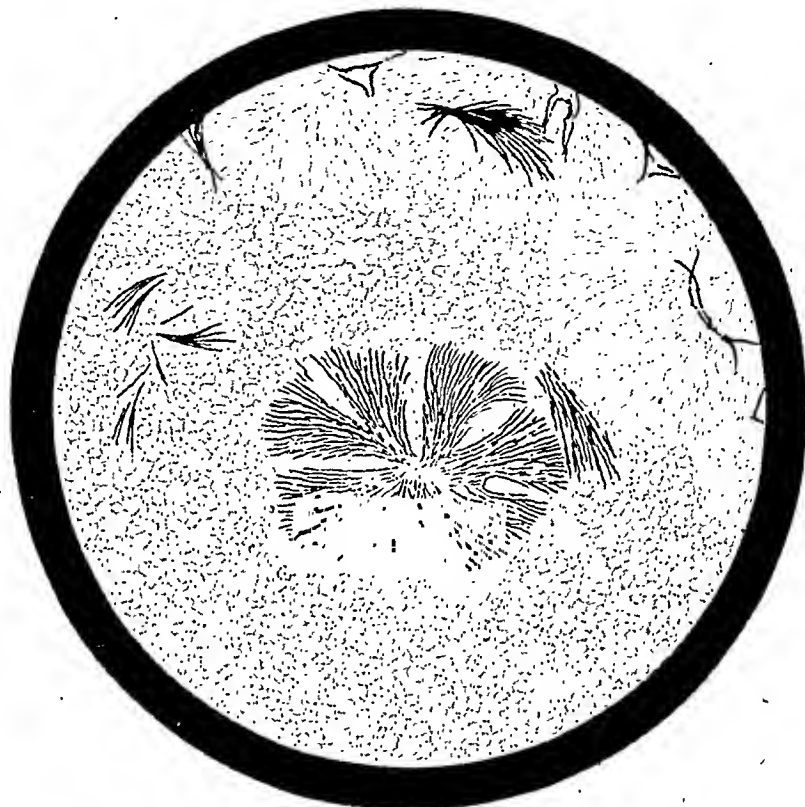


FIG. 2.



thorough examination of the indefinite cases of tuberculosis with tuberculin tests, and a careful search for the minute fungal grains in the discharges of granulomatous tumours may show that actinomycosis in human being is after all not so rare in this country as it is supposed to be, judging by the records.

#### MORPHOLOGICAL AND CULTURAL CHARACTERS OF THE ORGANISM.

*Naked eye appearances.*—The grains can be easily isolated from the thick viscid discharges by washing them in normal saline solution, rendered alkaline by adding 5 per cent. caustic potash, which deprives the outer gelatinous mass in which they lie embedded. The isolated grains look like so many fish-roe bodies, globular or reniform in shape of varying sizes, usually soft, of dull pearly-white colour, and often appear lobulated when they are in composite masses of three, four or more (see Plate III, Figs. 1 and 2). The sizes of the granules vary, I presume, with the duration of infection. Very minute grains of the sizes of poppy seeds were found in the discharges of case No. 2, which was only of three months' duration and granules of the size of sago grains were seen in cases Nos. 1 and 3, the duration of infection being not less than a year and-a-half in both the cases. The tiny grains, as observed in case No. 2, might often escape one's notice, unless he takes special care to examine them, as they often lie embedded in the thick viscid discharges of these infective granuloma.

*Microscopic appearances.*—When the washed isolated grains are mounted in 50 per cent. glycerine on a glass slide with a cover glass and on applying steady and gentle pressure the grains flatten out and under low power of the microscope show two distinct zones, a central portion, lighter in colour, and a thick, dark and radially striated cortex, surrounding the former; under high power, the central portion is seen to be composed of very fine mycelium of light yellow colour, branched and running in different directions, forming a network of threads, embedded in a more or less homogenous matrix. The cortical portion shows fungal hyphæ arranged radially, giving rise to the striated appearance (see Plate I, Figs. 1 and 2). In this portion, towards the extreme periphery, the hyphæ are often swollen, assuming a club-like appearance (Plate I, Fig. 2).

The above description is only true of the grains that are found in the discharges of cases that are rather old, but in cases of recent origin, as in case No. 2, the appearances of the minute grains are somewhat different. The filaments in these are found arranged radially in a fan-shaped manner, in different groups, with their inner ends all converging towards a point near the centre of the mass, thus giving rise to the characteristic astral

or ray appearance of these fungi (see Plate II, Fig. 1).

From the difference in the structural arrangement of the filaments in cases of recent and old origin, and from the presence of swollen ends of the hyphæ or "clubs" in the later cases, one is led to infer that the club formation may be due to the compression of the hyphal ends on account of the continued resistance of the tissues around, or it may be an indication of an approach towards spore formation—although I have not observed spores in any one of them, and authorities are agreed on the point that true spores are wanting in this group of fungi.

*Mycology.*—The fungus consists of branching mycelial threads composed of very thin hyphæ of varying sizes, from 3 micron in diameter to 1 micron; the clubs towards the periphery of a grain are usually over 1 micron, sometimes 1.5 micron in diameter. The walls are extremely thin and quite unlike the usual thick walls of the higher fungal filaments. The stained specimens sometimes show a beaded appearance of the mycelial threads.

*Staining properties.*—When stained with the ordinary aniline dyes the mycelial threads take the stain very badly. They are neither acid-fast nor alcohol-fast. They take beautiful stains by Gram's method, and when counter-stained with dilute eosin, the mycelial threads are found to be gram-positive, while the clubs when present are gram-negative (see Plate II, Fig. 2).

#### CULTURAL CHARACTERS IN NUTRIENT BROTH MEDIUM.

*Naked eye appearances.*—When the pure grains are transferred aseptically into the broth medium and kept under ordinary room temperature, the individual grains are found to increase in size gradually in the course of four to eight days, and appear as so many tiny pellets of cotton wool or tiny puff-balls. The individual colony may remain separate or cohere at the bottom of the flask, the medium remaining clear throughout (see Plate III, Figs. 4 and 4a). In case of turbidity of the medium, secondary bacterial contamination is the cause. In this connection it would be interesting to note that if such contamination supervenes, it becomes very difficult to isolate the fungal organism in a pure state. Repeated washing of the grains in sterile normal saline before cultivation has failed to eliminate the secondary organisms. But on finding out the optimum of the fungal organism which is about 70°C, and diluting the mixed discharges with sterile saline solution and keeping the same in a water bath of 60°C for half an hour, I have been able to isolate the grains from secondary bacterial contamination, and I could grow them in ordinary nutrient agar medium in a pure

condition in five or six days; but the growths are very slow and poor.

No change of colour was noticed in the colonies of this medium.

*Microscopic appearances.*—On examining the stained films prepared from the growths, I noticed, in young culture, the mycelial thread forms are the prevailing ones; but in old culture, irregular forms occur and appear like coccus or bacillus.

*In nutrient agar.*—When the pure grains are placed on agar slopes and incubated at 36°C. under aerobic condition, they show globular excrescences from their bodies and grow slowly for five to eight days, after which they appear as small raised waxy white colonies. There is but little tendency of the growths to spread on the surface of the media, but they heap up giving rise to raised colonies of various patterns (see Plate III, Fig. 2), and the colonies insinuate themselves into the substance of the media like the rootlets of vegetative growths, thus becoming so closely adherent to the surface that each colony had literally to be dug out while being transferred to other media. When the colonies are examined under a magnifying lens, they appear as raised colonies having a central elevated portion with shallow depressions running down irregularly towards the base which is surrounded by a slightly raised margin having fringes (see Plate III, Figs. 2a and 2b).

Some of the young colonies show regular star-shaped radiations of ashy gray or light sepia brown in colour at their bases. These often become obscured with the thick opaque growths and later on reappear rather irregularly as so many root-like processes dipping down in the media from the base of the colonies (Plate III, Figs. 2 and 2b).

With the age of the growth varying from two to three weeks, some of the colonies show changes of colour from waxy white to ashy gray.

*In glycerine agar.*—When the pure grains are placed on glycerine agar slopes and incubated at 36°C under aerobic condition, they swell up into soft waxy white masses which heap up in five or eight days in a peculiar fashion just like so many earthworm casts on the surface of the ground (see Plate III, Figs. 3, 3a, 3b). They do not spread on the surface but dip down in the substance of the media. Some of the colonies show changes of colour.

*Potato medium.*—I tried to grow the grains in potato medium after rendering it slightly alkaline; but could not find any growths even after a fortnight of the inoculation.

#### SUMMARY.

After carefully studying the morphological and cultural characters of the organisms separated from the cases recorded herein and comparing them with those mentioned in the recent standard

works on the subject of human actinomycosis, I have no hesitation to say, that all the cases under my observation are undoubtedly true cases of actinomycetes. I would now conclude my paper with the following résumé of the characters of the organisms observed by me.

(1) The organisms consisted of branching mycelial threads which show typical astral or ray arrangement of their hyphæ.

(2) The hyphæ show club formation.

(3) The walls of the filaments are very thin unlike the thick walls usually found in higher fungus filaments.

(4) Some of the filaments are not uniform in thickness and show beaded appearance.

(5) The organisms take the ordinary aniline dyes very badly. They are neither acid-fast nor alcohol-fast. They are stained beautifully with Gram's method, the filaments are gram-positive while the 'clubs' are gram-negative.

(6) They have been cultivated successfully in a pure condition in nutrient broth, nutrient agar, and glycerine agar media and show all the typical characters of actinomycetes. The star-shaped radiations and pigment formation are noticed in some of the colonies in ordinary agar and glycerine agar media.

#### ACKNOWLEDGMENTS.

Lastly, I would like to express my indebtedness to Lieut.-Colonel R. P. Wilson, F.R.C.S., I.M.S., Superintendent, Campbell Hospital, Calcutta, for permitting me to make use of the case No. 3, for the purpose of my paper, and my grateful thanks to Dr. G. C. Chatterjee, M.B., Rai Bahadur, Assistant Professor of Pathology and Bacteriology, Medical College, Bengal, for placing at my disposal some recent literature on the subject.

#### DESCRIPTION OF PLATE I.

Fig. 1. Appearance of a grain under low power with No. 3 objective, showing two zones, the inner lighter portion containing very fine mycelial threads surrounded by the outer dark striated cortex of swollen filaments.

Fig. 2. The same, under high power with No. 6 objective, showing the mycelial network and swollen hyphæ with club formations. Some of the clubs are found lying detached outside the general mass.

#### DESCRIPTION OF PLATE II.

Fig. 1. A tiny grain from case No. 2, under high power with No. 6 objective, showing the typical astral or ray arrangement of the filaments.

Fig. 2. Films of the smashed grains stained by Gram's method with dilute eosin as counterstain, showing the violet colour gram-positive branching filaments and the reddish colour gram-negative "clubs."

#### DESCRIPTION OF PLATE III.

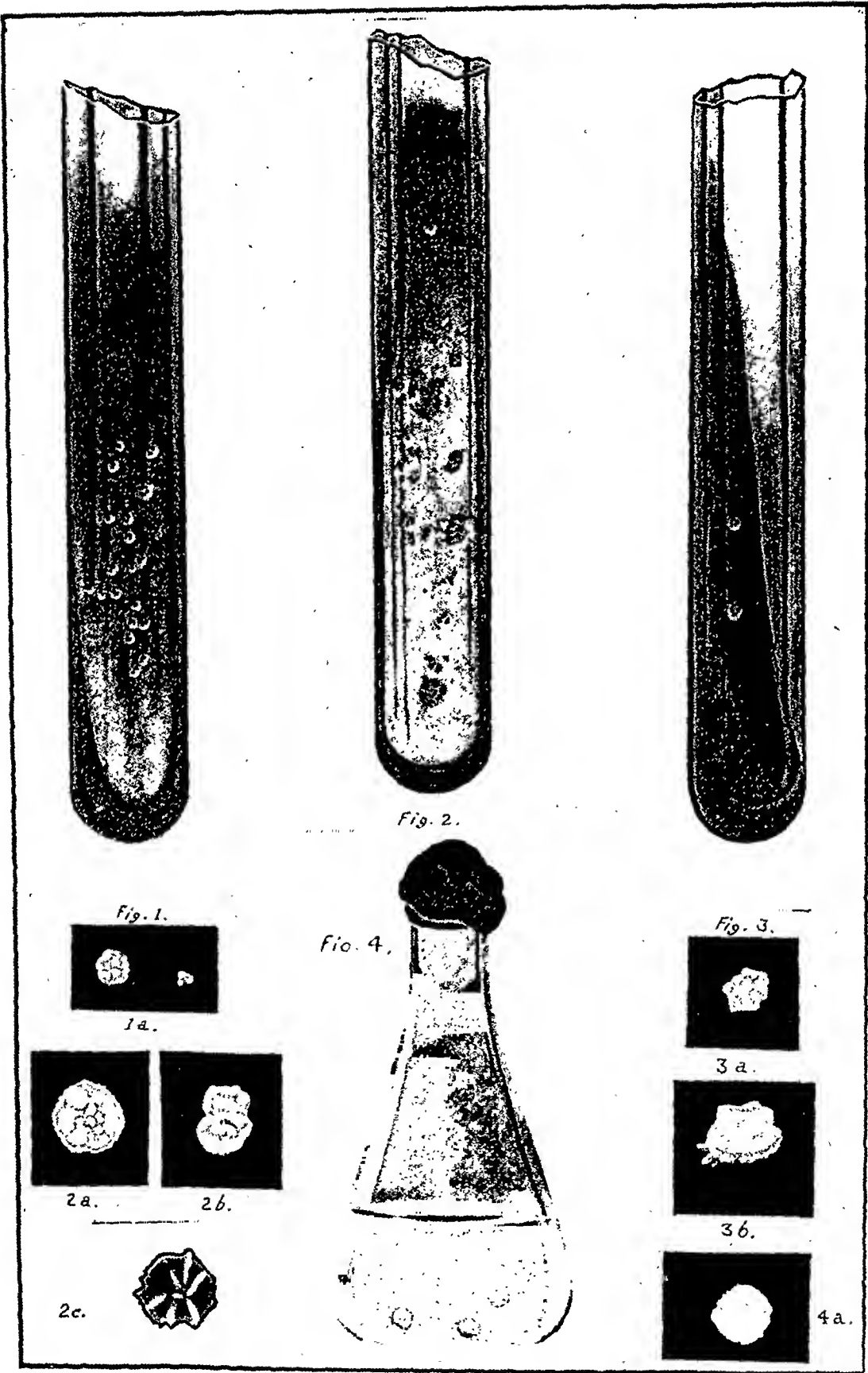
Fig. 1. The natural appearance of the isolated grains when placed on an agar slope for cultivation.

Fig. 1a. Two lobulated grains of composite masses of three and five, under a magnifying lens.

Fig. 2. Appearance of the various patterns of the growths from the grains in nutrient agar showing raised white colonies.

Fig. 2a. A colony under magnifying lens showing central elevation, depressions and fringed margins at the base.

Fig. 2b. A colony showing root-like processes of sepia brown colour, dipping into the substance of the media.





- Fig. 2c. A colony showing the pigmented star-shaped radiations at the base.  
 Fig. 3. Two raised white colonies in glycerine agar.  
 Fig. 3 (a & b). Under a magnifying lens showing the heaping up of the colonies, in a peculiar fashion like the casts of the earthworms, and also dipping into the substance of the media with pigment formation.  
 Fig. 4. Isolated colonies from the grains in nutrient broth media appearing as small white puff-balls. The medium remains quite clear throughout.  
 Fig. 4a. The same under magnification.

## DESCRIPTION OF PLATE IV.

Plate IV. A photo. from case No. 1 (A. K. D.) Showing the situation of the tumour and the wound on his back. The left side of the spine above the wound right up to the nape of the neck was swollen and indurated.

## A CASE OF ACTINOMYCOTIC PLEURO MEDIASTINITIS.

By BRAJABALHAV SAHA, M.D.,  
*Calcutta.*

M., a Hindu male of 22, of a wealthy family of Magura (Jessore), came to me complaining of pain in the right chest and fever for about two months. The trouble began, in his words, with ordinary cold about two months back from which he perfectly recovered; but since then he was feeling out of sorts—febrile towards evening off and on. Gradually and unconsciously pain has supervened over it.

On inspection nothing wrong was found except slight bulging extending from 3rd to 5th rib limited on the left by the right border of the sternum, and on the right about  $1\frac{1}{2}$ " from the sternal right border. No pulsation could be felt, but on the gentlest percussion he actually cried in pain. On auscultation a systolic murmur could be made out which was not conducted to the carotid, but curiously enough it was most marked at the right axilla, I was at a loss and could not account for it. His heart impulse could neither be felt nor seen. There was no large spleen or liver. Upper and lower border of liver was normal and it was not tender. On auscultation heart and lung were found to be normal.

He did not give any history of trauma, dysentery, alcohol or syphilis. On the following day his blood was examined.

|                   |                   |
|-------------------|-------------------|
| Report being:     | 21st April, 1917. |
| R. B. C.          | ... 4,600,000     |
| W. B. C.          | ... 14,000        |
| Hæmoglobin        | ... 70 per cent.  |
| Poly-morph.       | ... 84 "          |
| Large Mono.       | ... 5 "           |
| Small Mono.       | ... 11 "          |
| Malarial Parasite | ... nil.          |

This led me to think of its nature being inflammatory, but I could not exactly say what the mischief was. On the following day under Radio-screen the ribs, heart, aorta and liver were found to be normal.

Now I stopped at the two localized empyema and vascular sarcoma. But I could not discern between the two. At this time his evening temperature was 99-100 and there were morning remissions, but soon in a week's time his morning temperature did not go below 99, and there could be made out pleuritic friction-sound at the 8th and 9th spaces of the right mid-axillary line.

For diet he was put on egg flip, milk, sanatogen. When pleuritis appeared thinking it to be tubercular in origin, we put him on arsenic and syrup ferri iodide. The windows of his room were kept wide open night and day keeping him warmly covered.

The swelling now gradually increased and there was a distinct bulging. I consulted an eminent surgeon who could not be positive as regards diagnosis. He was thinking of sarcoma and localized empyema.

|                   |                  |
|-------------------|------------------|
| Blood picture     | 3rd May, 1917.   |
| R. B. C.          | ... 4,680,000.   |
| W. B. C.          | ... 14,000.      |
| Poly              | ... 82 per cent. |
| Large Mono.       | ... 4 "          |
| Small Mono.       | ... 14 "         |
| Hæmoglobin        | ... 68 "         |
| Malarial Parasite | ... nil.         |

Another ten days after I could find for the first time under my observation pericardial friction. As there were plural effusion marked by right basal dullness, we tapped him at the right scapular angle by a record syringe and 10 c.c. of fluid was taken out for diagnostic purposes. It was free from blood. Our opinion therefore swang from neoplasm to tubercular pleurisy.

The fluid was found to be sterile on culture media and being injected to a guinea-pig led to no development of tubercle.

|                    |                           |
|--------------------|---------------------------|
| Report being:      | 15th May, 1917.           |
| Physical character | —straw coloured with clot |
| Microscope:        |                           |
| Tissue elements.   |                           |
| R. B. C.           | ... nil.                  |
| Poly-morph.        | ... 29 per cent.          |
| Mononuclear        | ... 71 "                  |

Culture media sterile. A guinea-pig inoculated showed no symptoms even after a month. Though there was no development of tubercle in the guinea-pig, still the differential count, in the cytological examination of the aspirated fluid, led me and every one, whom I consulted, to take it for a case of tubercular pleurisy with local empyema. His treatment was therefore dietetic, hygienic, and tonic.

The pericardites cleared in a fortnight leaving no trace behind, but the said murmur became double loudest at the right axilla. Finding no relief whatsoever as he was having fever all through night and day—highest being 101, lowest 99-99.5—constant pain worse towards evening,



gradual emaciation and the bulging increasing he placed himself under a Kaviraj, but I had to see him once a week.

One day I noticed that the tumour mass had covered the lower end of sternum; feeling, boggy; skin over it was red and œdematous. Evidently there was some matter beneath.

The same surgeon opened it under anæsthesia. Some caseous looking mass came out and it did not bleed much. The cavity opened into was superficial to pectoralis major leading by a tiny hole to the pleural cavity. The surgeon asked me to get a Wasserman done, thinking it to be gummatous in origin. There was no history of syphilis in him, though his father himself had an irruption all over body with a penile ulcer before his birth.

On opening the wound for the first time after 48 hours of operation, I noticed greenish looking granules like roes of fish. Similar things I noticed in a case of Madura foot while a student of the Calcutta Medical College. Without doing Wasserman I got the granules examined. The report confirmed my suspicion—the granules were actinomycotic.

It is a month he has been operated on. Daily he is being syringed with 10% potash iodide solution according to Laplace. Internally he is taking 75 grains of potash iodide a day divided into 3 doses. For food he is taking 3 eggs, 1½ seer of milk, one chicken, ¼ seer of fish every day. Windows are kept wide open day and night. We are told, it is a very chronic disease. His wound has practically healed, leaving only a tiny scab at the upper end of the incision. This scab seems to be very refractory emitting a little serosanguinous discharge every third and fourth days. I do not know what fate awaits him, as best figures admit of only 22 per cent. recovery. Mortality being due to metastasis, secondary infection, amyloid degeneration of vital organs, and progressive asthenia.

The case under review from aforesaid treatment has gained in weight, put on flesh, improved in appearance, and is free from fever. He has got a glow of sound health, only trouble with him at present is the tiny little scab.

In the words of Emery (of the King's College, London), it (actinomycosis) crops up when least suspected. Nobody can diagnose it without the characteristic sulphur granules in the open wound. Here also the granules put me to the right track, though I was groping through the darkness all the three months availing myself of every assistance accorded by clinical medicine.

In conclusion, I have to thank Lt.-Col. J. T. Calvert, my teacher, for the kind interest he has taken in my case; Dr. M. M. Dutt, of physiological department for blood examination; and Dr. C. C. Bose, of pathological department, for bacteriological examination.

## ANOTHER "NEW" OPERATION FOR CATARACT.

(A Lecture at Clinical Society, Allahabad.)

By DR. TUSADDUK HUSAIN,

Eye Hospital, Allahabad.

LADIES AND GENTLEMEN.—Having shown to you the actual operation and some of the operated cases (6 hours to 3 years old), I must tell you that the chief advantage of this operation is the quick healing of the wound. Exogenous infection can occur only so long as the wound is unhealed, and this period in this operation is so short, that the preliminary mechanical cleansing (done before the operation), the presence of Collargol (dropped after the operation), the lower level, and the distant situation of the wound in the conjunctiva, are sufficient to prevent infection from travelling up a long way to the interior of the eye-ball during the short time that the flap takes to adhere. In virtue of this quality, suppurations are reduced to 0.4 per cent. in ordinary cases of cataract. In unclean eyes, therefore, this operation is the safest to do. I have been able to operate on very bad eyes, such as I would have pronounced unfit for other operations, in virtue of this quality. Trachoma is so common in India, and often requires such a prolonged treatment before the eye is fit for Smith's or the Capsulotomy operation, that only a very small percentage of the ordinary Indian patients have the patience or the means to undergo that prolonged treatment. The majority of the people, to say nothing of the village folk, shrink from this prolonged treatment, and prefer either to go to the "lens-coucher" or to pass the remainder of their lives blind. Why reject such cases? Do this operation and give every one of them a chance. In such cases, my operation succeeds almost as well as Smith's does in good cases. To learn this operation, therefore, is a necessity. It is not difficult to do, for any surgeon, who can do Smith's; for instance, I do extraction in capsule, and thus take advantage of the great advance in cataract extraction enunciated by Colonel Smith. My extraction is sub-conjunctival with a large conjunctival pocket-flap, so that I have taken advantage of the attempts of Czermak and Hari Shanker to produce quick healing of the wound.

Thus, I do not claim to give you entirely a new operation, but my method of procedure is different from all these great operators on cataract. The modifications are novel and my own, and make the operation a distinctive one, and I claim that, for a particular class of cases, it is the most suitable and rational procedure, and the only possible operation. Let me now describe to you the operation itself.

## THE OPERATION.

*Selection of cases.*—I do not select my cases. All cataracts that come to the Hospital with perception of light are taken and operated on. Some of these are cases returned from other districts as non-operable.

*Time of operation.*—Operations are done both in the day and by night. Carbide lamps are the light used at night. In virtue of short bandaging, hot weather and rains are no bar or disadvantage.

*Instruments.*—Instruments used are the ordinary ones, and a Keratome, a pair of very thin, curved, blunt-pointed Iris scissors, a pair of ordinary dissecting forceps, plenty of sterilized swabs on sticks, and an undine irrigator. No knife is used.

*Preparation.*—The face is washed with soap and water, the eye-lashes cut, a 2½ per cent. solution of cocaine is dropped every five minutes for an hour into the eye, which is kept all the time covered with a wet antiseptic pad. The lacrimal sac is well squeezed. The eye is then irrigated with boracic lotion (grain 5 to oz. 1), the reservoir being kept 5 feet above the eye. The eye is further washed with sterilized water by means of an undine. Solution of Adrenalin chloride (1 in 1000) is then dropped into the eye three times at intervals of 3 minutes, and the operation is begun. In suspicious cases, I do more of mechanical cleansing, and also give a mixture containing mercury and iodide of potassium for a week, and order a purgative the day before the operation, especially if the case is plethoric or has a hard pulse. I prefer to use chloroform in children and infants; I use atropine in the case of children and adults with traumatic and secondary cataracts.

*The asepsis.*—I wear a mask, boil the whole lot of instruments for each of the several operations in one sitting; keep water close at hand, boiling all the time, to immerse the point of any instrument which has to go into the anterior chamber for a second time, keep the instruments dry in a sterilized tray, and do not allow any liquid to pass from the conjunctival sac into the anterior chamber. During irrigation, I control this by turning the head of the patient to one or the other side. The swabs are kept out of the liquid in which they were boiled, and one swab is used only once. The water for irrigation is boiled in the same undine.

I observe these rigid precautions, because I believe that if the interior of the eye-ball is protected from the conjunctival infection during the actual operation, it has little chance to be infected afterwards, during the short time that the flap takes to adhere, on account of the distant situation of the conjunctival wound, and its position on a lower level than the entrance to

the eye-ball through the sclero-corneal wound. The overflowing aqueous, if any, only acts favourably. I keep this point of gravitation in view, in advising my patients which side to turn first from their position on their back.

*The Assistant.*—I have two assistants. One controls the brow with one hand, and fixes the globe by means of a fixation forceps with the other, until the stage of the expression of the lens. The other assistant lifts up the flap and helps in swabbing.

## THE TECHNIQUE.

I insert a speculum and keep it in, during the whole of the operation. The first assistant holds the eye-brow to control the orbicularis with one hand, and with the other steadies the eye-ball by means of a fixation forceps diagonally opposite to the situation where the flap is to be made.

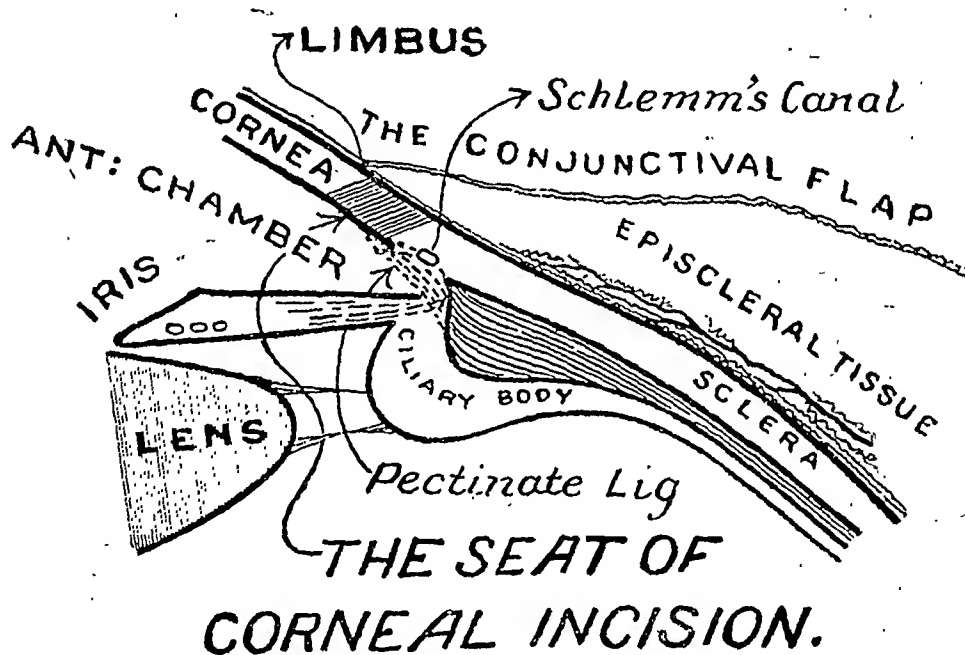
(1) *The pocket-flap.*—With a fixation or dissecting forceps, I lift up the conjunctiva about one-third or half an inch or so, away from the sclero-corneal junction, and make a snip into it with a curved, sharp-pointed scissors; I then lift up the forceps (holding the conjunctiva) further forwards, and cut into the sub-conjunctival tissue with the concavity of the scissors towards the globe, up to the limbus. I then raise the flap still further forwards and push the closed scissors with concavity towards the cornea on one side of the centre of the flap. By lateral movements of the closed scissors, a pocket is formed which extends right up to the limbus towards the cornea. I do the same on the other side. In this way capacious pockets are formed on both sides of the central portion of the flap, extending much further forwards than the level of the incision. I now enlarge the original snip in the conjunctiva enough to deliver the lens. The pocket-flap is now ready, and holds an intermediate position between the undermined pocket of Czermak and the free flap of Hari Shanker. It is thus just sufficient to allow all the steps of the intracapsular extraction to be conducted, without having the disadvantage of the risk of displacement to which all free flaps are liable.

Any blood, or blood clot, if present, may be wiped off with swabs on sticks. If bleeding occurs, cocaine and adrenalin solution should be dropped by the other assistant. If it is profuse, which is rare, I remove the speculum and allow the patient to squeeze his eye lids for a while, which stops all bleeding.

Button-holing is rare at this stage. The older the patient the easier is the flap made. I try to make the flap as thin as possible. This is easiest to do in the aged. Other things being equal, the inner flap is most easily made, but the outward one is least liable to displacement. In prominent eyes, as upper flap; in eyes which

roll up, a lower flap; in right eyes, an outer; and in left eyes, an inner flap, is, as a rule, convenient. In special conditions, *e.g.*, opacity of cornea, flaps are made at intermediate sectors. In 1,000 cases I made flaps upwards in 413, downwards in 67, outwards in 246, inwards in 157, and at intermediate sectors in 117.

The younger the patient the less easy it is to make a thin flap. In trachomatous cases the flap is comparatively thick. When the flap is thick by the adherence of much of the episcleral tissue, it takes longer to unite and is liable to get displaced. If vitreous escapes with such a flap, a stitch should be put to prevent its displacement. I had to do it 3 times in 1,000 cases. A thin flap is easily separated up to the limbus and allows ample room to place the incision quite out of the filtration area, there being always sufficient room in the anterior chamber. The diagram below shows the seat of the corneal incision and its relations to other structures.



(2) *The puncture.*—I lift up the flap at its central portion with the left hand, and puncture the sclero-corneal junction, the line of which is clearly defined by swabbing by the second assistant, with an angular keratome, taking care not to injure the capsule.

(3) *The incision of cornea.*—I lift up the flap with the left hand, and pass into the anterior chamber, through the opening made by the keratome, one blade of the thin, curved, blunt-pointed, iris scissors, the other blade being under the flap, and cut the sclero-corneal junction, first on one side of the flap, then on the other, till half of the corneal circumference is divided. This is rather a delicate part of the operation. The scissors must be thin and sharp. One must always be careful to see that the inner blade of the scissors remains clearly visible in front of the

iris all the time, until the section is completed. If there is any blood in the anterior chamber, irrigation is done, so that there may be no difficulty in seeing the blade of the scissors. If the inner blade penetrates into the iris, it is liable to give the patient pain, puncture the capsule, and injure the region in the neighbourhood of the ciliary body (known as the dangerous area); if this accident happens, one should drop eserine after the operation and guard against cyclitis.

The inner blade of the scissors touches the iris, but the cocaineisation has been so thorough that the patient does not feel pain. While the incision is being made the flap should be raised to avoid button-holing. It is at this stage that the pockets run a risk of button-holing.

(4) *The iridectomy.*—The second assistant now lifts up the conjunctival flap, while the operator taking the curved iris forceps in the left hand, and the curved blunt-pointed iris scissors in the right, performs an iridectomy.

(5) *Expression of the lens.*—The first assistant now removes the fixation forceps, and lifts up the speculum, with that hand. The second assistant should be ready with a dissecting forceps to lift the flap up, the moment the lens, in passing out, raises it. I take two strabismus hooks, one in each hand, and press with the points of the hooks on the remote edge of the lens to dislocate it, when the other edge bulges and raises the flap which is now lifted up by the second assistant, I keep up pressure with one of the hooks, and slide the other towards the wound, pushing the lens before it, and out of the conjunctival flap. If need be, I apply some counter-pressure on the sclera with one of the hooks with its horizontal portion. In most cases the lens comes out easily. If it does not, I ask the assistant to leave the speculum, while I

repeat the manoeuvre. If vitreous escapes before the lens, I use a vectis. If the vitreous escapes after the lens, I ship it off with a blunt-pointed scissor inside the pockets along the whole length of the corneo-scleral wound. The flap is lifted up during this act, and so is not in the way.

If the capsule ruptures, I do not release the pressure of the hook, but pass the dissecting forceps to remove as much of the capsule as can be seen and removed, using the irrigator for the rest. If the capsule or cortex is lying far from the wound, I use a capsule forceps. The conjunctival flap does not prevent the passage of these forceps.

(6) *Replacing the iris.*—I take an iris repositor and pass it in each of the two pockets moving it up to the anterior chamber, thus spreading the cut ends of the iris well into the chamber. I have met with no difficulties in replacing the iris in this way.

(7) *Replacing the flap.*—I now pull the flap over the globe so as to replace it to its original position, with the dissecting or fixation forceps and smooth it down fully, stroking it round from the corneal junction on all the sides by means of a thin swab or iris repositor. A thin flap is easily replaced, but a thick clumsy flap does not reach quite up to the line of the original incision.

I drop one or two drops of 2 per cent. collargol lotion, and close the lids, taking care specially, in case the flap is made upwards or downwards, that, in closing the lids, the flap is not disturbed, smear the closed lids with 1 per cent. yellow ointment, bandage both the eyes; and send the patient on a stretcher which has been spread on the operating table beforehand.

#### THE AFTER-TREATMENT.

The patient lies on his back for six hours, and is then allowed to turn on his side. The bandage is opened in 12 to 24 hours, and the patient is allowed to walk about, and permitted to leave the hospital, if he desires to do so, but on the distinct understanding that he is to attend as an out-patient for ten days.

By working up figures, I find that the average stay in Hospital has been 4.84 days.

He is also advised to keep the operated eye either regularly bandaged or covered with a big shade for a few days, and not to use it for close work for 3 months, at the end of which time he is directed to present himself for proper glasses.

#### ULTIMATE RESULTS.

I have made special efforts to collect as many patients after 3 months as possible, but up to this time only 165 have arrived. They have been tested by retinoscopy and with trial lenses and the following are the visual results:—

|                                 |   |   |                                |
|---------------------------------|---|---|--------------------------------|
| 2 are found to have 6/4 vision. |   |   |                                |
| 102                             | " | " | 6/6 "                          |
| 43                              | " | " | 6/9 "                          |
| 7                               | " | " | 6/12 "                         |
| 6                               | " | " | 6/15 "                         |
| 1 is found                      | " | " | 6/21 "                         |
| 2 are found                     | " | " | 6/30 vision (high astigmatism) |
| 2                               | " | " | 6/60 vision (exudative choro-  |
|                                 |   |   | ditis)                         |

Out of the above patients, 33 required spherocylinders, the power of the cylinders varying from 1 to 4.

The results are therefore:—

Good vision in 154 out of 165 cases; or 93.60 per cent.

Indifferent vision in 11 out of 165 cases, or 6.40 per cent.

I give you now analysis of 1,000 consecutive operations done by this method.

#### THE ANALYSIS.

Out of these 1,000 cases—

(1) 93 were unripe cataracts, unsuitable for capsulotomy operations, Daviel's or Czermak's.

(2) 158 were bad eyes, which I would not venture to operate on, by Smith's method.

(3) 12 were cataracts in infants and children.

(4) 737 were ordinary cases.

(1) Out of 93 cases of unripe cataracts the capsule burst in 6, resulting in more or less dense after-cataract. One case got irido-cyclitis, resulting in phthisis bulbi. The rest, i.e., 86 did well.

(2) The 158 bad eyes had the following diseases: trachoma 61, copious mucus discharge 13, ulcer of cornea 2, old iritis 6, lachrymal diseases 5, blepharitis 3, defective lids 10, pterygium 6, ozena 17, chronic bronchitis, emphysema, and asthma, etc., 15, general diseases 20.

And the results in these bad eyes are as follows:—

*Suppuration* 3, one patient had trachoma, one corneal ulcer, and one sore throat.

*Intra-ocular hæmorrhage* 2, one patient had arterio-sclerosis, the other anæmia.

*Detachment of retina* 1, the patient had trachoma.

*Irido-cyclitis* 2, one patient had lunacy.

*Keratitis resulting in permanent corneal opacity* 4, three patients had ozena, one had trachoma.

Out of 158 bad cases, which would be rejected as unfit for operation by other operators, 12 failed and 146 succeeded.

(3) In the 12 congenital and soft cataracts, capsulotomy was done and the lens extracted by extraction, suction, or irrigation. In one infant a stitch was put on the flap. Chloroform had to be given to 5 of them. None of these 12 had any complications.

(4) The remaining 737 were ordinary cases, and the following accidents happened in them.

Flap injured 6, iris injured badly 3, capsule burst 96, vitreous escaped 83, Vectis used 17, lens drowned and left behind 1, cornea abraded 2. Some of these cases were nervous.

And the following are the failures in these 737 cases:

*Iritis. Irido-cyclitis* 3, in 2 capsule had burst.

*Keratitis with vision nil* 7, the striped keratitis did not clear up. In 2 capsule had burst, in 1 the iris had been injured badly, in 1 the vitreous had escaped.

*Suppuration* 2, no accident of any kind had happened.

*Secondary Glaucoma supervening in cyclitis* 1, in this case the capsule had burst.

*Detachment of retina* 2, in these cases no accident had happened, and there was nothing in them to indicate this complication.

Out of 737, then, the results are that 722 cured, and 15 failed.

Out of the total 1,000 consecutive cases the results, then, are as follows:—

29 failed, that is, had no vision.

6 required secondary operation for after-cataract.

2 had poor vision (fingers 1ft.), fundal disease.

963, including 146 bad cases, recovered, *i.e.*, had sufficient vision to read or to recognize cereal grains with glasses. The percentage of mortality of the eyes from all causes is:—

2.19 in ordinary cases.

7.59 in bad cases.

It follows, therefore, that 92.41 percentage of those patients who are usually rejected as unfit for operation have been cured, *such is the advantage of this operation*. In ideal cases any of the operations would succeed, but in bad cases this is the only operation which can be done with a reasonable hope of success.

In good cases, too, I have had more success by this method than by any other. My percentage of success may not be a very high one, but I am sure that I have never had this amount of it in any other operation, except in Smith's

(a) when done in the winter season,

(b) for good cataracts,

(c) in persons of good health,

(d) of the age of from 40 to 60,

(e) and who do take rest in the recumbent position.

When these conditions are fulfilled I still do Smith's operation. I prefer to do capsulotomy in young persons. I am not in favour of sticking blindly to my own method of operating on all the cases of cataracts as a routine proceeding, but I hold that each case must be operated on its own merits, and that the surgeon must decide for himself what operation would most suit the individual case. Let me tell you the conditions where my operation is most suited.

## THE ADVANTAGES.

(1) It is the only operation which can be done in the following conditions:—(A) in that contagious stage of trachoma which is characterised either by (a) the existence of a discharge, (b) or the existence of grayish follicles over the inner surface of the lids, (c) or a gelatinous appearance of the thickened conjunctiva, (d) or the presence of redness in the eye. (B) In eyes with unhealthy lachrymal passages; recently healed ulcers of cornea, blepharitis, copious mucus discharge, skin diseases over the face, distichiasis, operated entropion or any other condition where the lids do not close completely. (C) In persons where on account of some disorder in general health vomiting is expected.

(2) This operation is safer to do (a) in other stages of trachoma, (b) in cases with pterygium, old iritis, and watery discharge. (c) In persons with a history of a recent septic focus in the other eye or one eye lost from suppuration following cataract extraction. (d) In persons with ozena, or any other kind of ulceration in the nose, nasopharynx, or throat, with facial paralysis, shaking palsy of the aged, or marked nystagmus, or with purulent discharge from the ears.

(3) In all those patients who cannot remain in the recumbent position, such as persons with persistent cough, asthma, bronchitis, bronchiectasis, emphysema, or heart diseases, or in patients with albuminuria, hypertrophied prostate, or straining in micturition, or other diseases; such as, dementia, nervousness, melancholia, epilepsy, etc.

I am not against any preliminary treatment for the eyes, lids, or general health, but the difficulty is that masses of Indian patients select to go to a "lens coucher" in preference to such treatment, while some of the diseases and conditions mentioned above are incurable.

This operation is also advantageous and convenient in the following:—

(4) In stupid, unruly, deaf, nervous, and frightened patients who jerk their eyes about on small provocation and are thus very liable to accident under the ordinary operation, behave remarkably well during this operation, partly due to the greater anaesthesia induced by the combination of adrenaline and cocaine, and partly due to the fact that they are not worried with instructions to keep their eyes strongly rotated in any direction.

(5) In anæmic, emaciated, and weak persons where all corneal incision heal badly.

(6) In drinkers, where delirium not infrequently occurs when both eyes are bandaged.

(7) In old people suffering from marasmus who are apt, if they are made to lie quiet on their back for several days, to get hypostasis in



the lungs which may even cause the patient's death.

(8) In the case of infants and children, where quietude of behaviour after the operation is not to be expected.

(9) In the hot weather and the rains when a prolonged bandaging is liable to produce eruptions which, in turn, lead to sepsis.

(10) In prominent eyes where vitreous is likely to escape in corneal incisions, while in this operation the wound cannot well be forced open by spasmodic closure of the lids, nor can it be pulled open by extreme vertical movements of the globe; this advantage is greatest where the fornices are much retracted by scarring or in the case of exophthalmos.

(11) In small eyes where the upper portion of the cornea is not well exposed and the operator is cramped for field, this operation can easily be done with the flap either inwards or outwards.

(12) In those eyes, which roll up so hopelessly, that almost the whole of the cornea gets hidden beneath the upper lid, and which consequently have to be dragged down with fixation forceps for making the upward incision, this operation is easily done by making the flap in the lower sector of the eye. Also in other conditions which call for the lower operation, such as, the presence of a coloboma below, congenital or manufactured.

(13) In patients with corneal opacity, this operation admits of greater latitude; we can incise the flaps inwards, outwards, upwards, downwards, or at any of the intermediate positions instead of confining our incision to the upper sector.

(14) In the most of the Indian hospitals where beds cannot often be spared for preliminary treatment and an operation which keeps the beds least engaged for after-treatment is always desirable. This operation, which is so independent of preliminary treatment and requires so little of after-treatment is most suited.

#### THE DISADVANTAGES.

(1) Striped keratitis is more common, it was found on first opening the bandage in a great number of cases (15 per cent.), the majority of whom recovered normal luster of cornea within the first week, others took three or four weeks to obtain normal vision. Ten cases, however, passed into permanent corneal opacity which are shown as failures in the analysis above. Out of the total failures of 2.90 per cent., one per cent. is due to the cornea alone. This is rather high. Why it should be so I am at present unable to say; I am collecting notes of my observations on this particular subject and may be able to deal with it in future.

(2) It takes a longer time to do this operation, but my cases have not got nervous from this cause.

(3) It requires two assistants: *my compounders help me.*

(4) It requires a greater quantity of cocaine, and adrenalin chloride solution in addition.

(5) The redness in the eye, which is chiefly due to the staining by blood in the pockets, takes a long time (about a month) to disappear; *but it otherwise does no harm.*

(6) Prolapse of iris is difficult to deal with, but fortunately this complication is very rare. I have found it only in three cases as yet. I dissected the flap at the expense of the prolapsed iris, cut and removed the iris, and the flap again united in two or three days' time. Incarceration of the iris at its base does not take place.

These disadvantages are not serious in view of the fact that the advantages of the operation are far more weighty. *Its usefulness in trachomatous and bad health patients cannot be overestimated; not only is it crowned with success in doubtful cases, but affords one of the most speedy cures ever obtained in surgery.*

I hope, therefore, that the profession will try the operation, and I shall always be happy to welcome any member of the profession who comes to see the operation when I shall also show how I keep my 'notes and observations.'

## A Mirror of Hospital Practice.

### RECTAL ANÆSTHESIA. (REPORT OF 82 CASES.)

By R. H. H. GOHEEN, B.A., M.D.,

*Mission Hospital, Vengurla.*

ABOUT three years ago a method was devised by Gwathmey of administering ether mixed with oil by rectum for the production of general anæsthesia. Lumbard later reported its use in 36 cases.

Letters of inquiry from several surgeons in India, who had heard of our use of this method, have led to this report.

During the last twelve months, about 1,400 operations have been performed in the Mission Hospital. The anæsthetics employed include:—chloroform, about 500 cases; ether, by inhalation, about 300; local anæsthetics, about 300; intraspinal injection, about 15; and ether, by rectum, 80 cases. (A number of operations were performed under one anæsthesia.)

Rectal administration of ether for general anæsthesia was first tried here on 4th January, 1916, for thyroidectomy. This case and one of cleft-palate are first described in detail before proceeding to take up the later series of 80 cases—for reasons that will appear.

The first case selected (Hospital No. 2248), was a large thyroid tumour of the right lobe extending well up to the mastoid. The patient

a woman of 42, gave a history of slow development of the tumour for 10 years, but only lately had felt uncomfortable. On examination, the pulse was found to vary from 90 to 150. No exophthalmos: physique fairly good. Anæsthesia was induced by a "hypo" of morphine and atropine at 1-30 P.M., followed by ether-oil mixture (as hereinafter described) per rectum at 2-0 as she lay quietly in her bed. Operation note: "Anæsthesia is very satisfactory. A long curvilinear incision, with division of the right sterno-hyoid, sterno-thyroid, and sterno-mastoid muscles, revealed an oblong, large tumour of the right lobe of the thyroid extending to the mastoid, and very adherent. Dissection proceeded slowly until the superior thyroid vessels were ligated, after which the tumour was rapidly removed. Hæmorrhage moderate and carefully controlled by catgut ligatures. A small, soft tube drain was placed and H. P. gauze dressings applied. Time, 60 minutes. Pulse, before 100; after 120." Recovery of consciousness was a little slower than by inhalation methods, however was complete within several hours, and the general condition was good. Twelve hours after operation a capillary oozing set in, the pulse began to fail; saline proctoclysis and three pints of intravenous saline were given. A suitable donor for blood transfusion could not be found and the heart ceased 24 hours after operation.

Six weeks later, a cleft-palate was operated. The patient (No. 2345) was a boy, aged 8 months. To begin anæsthesia, chloroform was given by inhalation and then the ether-oil mixture introduced into the rectum. Operation notes: "Satisfactory anæsthesia obtained for a time when an occasional whiff of chloroform had to be added to deepen anæsthesia. The very wide cleft could only be closed by fracturing the maxillary bones, after which an attempt was made to draw the bones together with silver wire. This was not strong enough, and had to be supplanted by rather heavy silk which was then tied over two small lead plates. Satisfactory approximation was thus secured. The free margins of the cleft were then excised and the raw edges of mucosa and periosteum united with silver wire sutures. Hæmorrhage was moderate. Duration, 2 hours. Pulse, before and after 120." The patient regained consciousness about three hours after operation and condition was good. Three tarry motions were passed in the night—swallowed blood? Twenty-seven hours after the operation convulsions suddenly occurred, the right arm becoming stiff and twitching of the right side of the face observed. Temperature then rose rapidly to 104 and death ensued within two hours.

It is possible that this was due to fat embolism. Somewhat discouraged by these results no further use was made of rectal ether until eight months later, that is one year ago, when a new

series was begun which embraces 80 administrations in 70 individuals, of which the particulars are given on the following page.

#### Observations.

Age variations, 1 to 77 years.

Sex, males 33; females 37; total 70 individuals.

Ten patients were given rectal ether for a second operation.

*Shock*:—Average increase in pulse rate in 69 cases, 13.5 beats. Average decrease in pulse rate in 11 cases, 7.5 beats.

In but two cases was there evidence of severe shock, *viz.*, series No. 10 and No. 59. The facts were as follows:—

(a) In series No. 10, a very extensive tuberculosis of all the glands of the right side of the neck, including the lower half of the parotid gland and the entire submaxillary salivary gland, was dissected away. Much caseation and scarring were found. The patient had been treated in the open ward of hospital for seven weeks previous to operation with tonics, sunbaths, vaccines, and forced feeding, but without improvement. Very little blood was lost at operation, which lasted 100 minutes. In spite of stimulation patient did not rally and died 16 hours after operation.

(b) Only one laparotomy (series No. 21) was attempted. The entire colon was inflated and a portion of the small bowel, by ether vapour, in this way interfering with intra-abdominal work.

(c) These cases did not stay for other necessary operations and so could not be pronounced cured.

(d) Colitis developed in this patient after operation and thus drew attention to the fact that there had been previous evidence of peritoneal tubercle. After this experience care was taken to exclude all cases with a history or signs of abdominal tubercle or dysentery, from the method.

(e) Death occurred 72 hours after operation, from a deepening coma due to necessary ligation of the common carotid. This case was far advanced and was very reluctantly undertaken at the urgent request of the patient, who had suffered greatly from pain and insomnia.

(f) Syphilis was a complication and patient left before treated effectually.

(g) Patient left before wound was quite healed.

(h) Death occurred suddenly 14 hours after operation, from dyspnoea; no hæmorrhage. Cause, fat embolism.

(i) Temporarily considered cured.

(j) Tubercle of lungs and joints remained uncured on leaving.

(k) In series No. 59, a similar condition was encountered. Tonsillectomy had been done ten days previously under chloroform. The operation on the right side of the neck—under rectal ether—was very tedious, requiring 140 minutes. Pulse of 154 indicated considerable shock, but under stimulation all signs of this were

## TABULATION.

| Series No. | Hospital No. | Age. | Sex.  | Operation for                     | Time. | Pulse.  | Final result |
|------------|--------------|------|-------|-----------------------------------|-------|---------|--------------|
|            |              |      | M. F. |                                   | Mins. | Be. Af. |              |
| 1          | 2772         | 2    | 1 0   | Hare lip ...                      | 20    | 108     | 112 C.       |
| 2          | 2835         | 9    | 0 1   | Cleft palate ...                  | 120   | 94      | 112 C.       |
| 3          | 2848         | 11   | 1 0   | Tubercular glands of neck         | 30    | 96      | 100 C.       |
| 4          | 2883         | 15   | 0 1   | Ditto (left) ...                  | 85    | 92      | 110 C.       |
| 5          | 2883         | ...  | ...   | Ditto (right) ...                 | 70    | 92      | 120 C.       |
| 6          | 2884         | 20   | 1 0   | Ditto                             | 75    | 90      | 108 C.       |
| 7          | 2886         | 11   | 0 1   | Mastoid for ch. otitis ...        | 40    | 90      | 115 I.       |
| 8          | 2888         | 45   | 1 0   | Resection parotid tumour          | 40    | 76      | 90 O.        |
| 9          | 2891         | 14   | 1 0   | Tubercular glands of neck         | 30    | 94      | 100 C.       |
| 10         | 2894         | 35   | 1 0   | Ditto                             | 110   | 84      | 16" D. (a)   |
| 11         | 2905         | 31   | 0 1   | Ditto                             | 105   | 88      | 80 I.        |
| 12         | 2914         | 27   | 1 0   | Ditto                             | 103   | 84      | 94 C.        |
| 13         | 2919         | 16   | 1 0   | Ditto (right) ...                 | 25    | 90      | 94 C.        |
| 14         | 2919         | ...  | ...   | Ditto (left) ...                  | 45    | 92      | 98 C.        |
| 15         | 2915         | 16   | 1 0   | Ditto (right) ...                 | 120   | 78      | 94 C.        |
| 16         | 2945         | ...  | ...   | Ditto (left) ...                  | 45    | 78      | 120 C.       |
| 17         | 2972         | 5    | 1 0   | Muscle advancement, strabism      | 20    | 102     | 108 O.       |
| 18         | 2974         | 55   | 1 0   | Carcinoma of cheek and neck       | 80    | 84      | 92 C.        |
| 19         | 2977         | 13   | 0 1   | Tubercular glands of neck         | 85    | 102     | 110 C.       |
| 20         | 2977         | ...  | ...   | Ditto axilla                      | 20    | 84      | 96 C.        |
| 21         | 2982         | 30   | 0 1   | Laparotomy for adhesions          | 25    | 92      | 94 I. (b)    |
| 22         | 2995         | 3    | 1 0   | Contracted scar of arm            | 45    | 114     | 120 C.       |
| 23         | 2997         | 19   | 0 1   | Tubercular glands of neck (left)  | 70    | 92      | 98 C.        |
| 24         | 2997         | ...  | ...   | Ditto (right) ...                 | 50    | 92      | 88 C.        |
| 25         | 2999         | 25   | 0 1   | Thyroidectomy for adenoma         | 40    | 100     | 90 C.        |
| 26         | 3007         | 50   | 0 1   | Branchial cyst                    | 70    | 94      | 820 C.       |
| 27         | 3020         | 25   | 0 1   | Tubercular glands of neck (right) | 120   | 94      | 120 I. (c)   |
| 28         | 3028         | 77   | 1 0   | Sequestrotomy, jaw                | 10    | 96      | 98 C.        |
| 29         | 3036         | 9    | 0 1   | Submaxillary cyst                 | 30    | 104     | 128 C.       |
| 30         | 3045         | 12   | 0 1   | Mastoid, radical                  | 60    | 101     | 98 C.        |
| 31         | 3053         | 45   | 0 1   | Tubercular glands of axilla       | 60    | 96      | 88 C.        |
| 32         | 3055         | 43   | 1 0   | Ditto neck                        | 85    | 90      | 102 I. (d)   |
| 33         | 3066         | 8    | 1 0   | Hydrocele of cord                 | 25    | 76      | 90 C.        |
| 34         | 3071         | 21   | 1 0   | Tubercular glands of neck         | 85    | 102     | 110 C.       |
| 35         | 3105         | 60   | 1 0   | Sarcoma of neck                   | 70    | 78      | 102 D. (e)   |
| 36         | 3117         | 29   | 1 0   | Tubercular glands of neck         | 90    | 90      | 84 C.        |
| 37         | 3140         | 30   | 0 1   | Ditto breast and axilla           | 20    | 88      | 92 C.        |
| 38         | 3141         | 11   | 0 1   | Ditto neck                        | 75    | 100     | 108 C.       |
| 39         | 3147         | 1    | 0 1   | Hare lip ...                      | 30    | 142     | 148 C.       |
| 40         | 3159         | 25   | 0 1   | Tubercular glands of axilla       | 15    | 90      | 94 C.        |
| 41         | 3169         | 8    | 0 1   | Ditto neck                        | 60    | 90      | 100 C.       |
| 42         | 3180         | 30   | 0 1   | Ditto                             | 55    | 96      | 102 C.       |
| 43         | 3185         | 33   | 1 0   | Ditto                             | 40    | 90      | 98 I. (f)    |
| 44         | 3204         | 30   | 0 1   | Ditto                             | 15    | 74      | 84 I. (e)    |
| 45         | 3247         | 14   | 0 1   | Ditto (right)                     | 45    | 78      | 120 C.       |
| 46         | 3247         | ...  | ...   | Ditto (left)                      | 30    | 70      | 90 C.        |
| 47         | 3248         | 11   | 1 0   | Osteoma of nose                   | 35    | 84      | 92 I. (g)    |
| 48         | 3254         | 17   | 0 1   | Scar, breast and axilla           | 90    | 78      | 96 D. (h)    |
| 49         | 3281         | 9    | 0 1   | Tubercular glands of neck         | 30    | 98      | 100 C.       |
| 50         | 3307         | 60   | 0 1   | Carcinoma of breast               | 30    | 70      | 80 C. (i)    |
| 51         | 3308         | 22   | 1 0   | Branchial cyst                    | 20    | 82      | 84 C.        |
| 52         | 3309         | 63   | 0 1   | Carcinoma of breast               | 35    | 70      | 84 C. (i)    |
| 53         | 3314         | 35   | 0 1   | Tubercular glands of neck         | 40    | 108     | 98 C.        |
| 54         | 3314         | ...  | ...   | Ditto (left)                      | 25    | 112     | 98 C.        |
| 55         | 3325         | 23   | 0 1   | Carcinoma of breast               | 50    | 90      | 98 C. (i)    |
| 56         | 3355         | 22   | 0 1   | Tubercular breast                 | 45    | 100     | 96 C.        |
| 57         | 3367         | 20   | 1 0   | Tubercular glands of neck         | 25    | 90      | 98 I. (j)    |
| 58         | 3369         | 9    | 1 0   | Ditto                             | 30    | 96      | 110 C.       |
| 59         | 3401         | 22   | 1 0   | Ditto (left)                      | 140   | 90      | 154 C. (k)   |
| 60         | 3401         | ...  | ...   | Ditto (right)                     | 120   | 100     | 104 C.       |
| 61         | 3409         | 16   | 0 1   | Branches of V nerve               | 60    | 78      | 84 N. I.     |
| 62         | 3413         | 12   | 1 0   | Mastoid for otitis                | 30    | 84      | 102 N. I.    |
| 63         | 3424         | 49   | 0 1   | Carcinoma of breast               | 40    | 98      | 108 C. (i)   |
| 64         | 3438         | 25   | 1 0   | Tubercular glands of neck (right) | 45    | 90      | 90 C.        |
| 65         | 3438         | ...  | ...   | Ditto (left)                      | 25    | 86      | 92 C.        |
| 66         | 3442         | 60   | 0 1   | Sarcoma of breast                 | 45    | 120     | 124 C. (i)   |
| 67         | 3445         | 25   | 1 0   | Tubercular glands of neck         | 90    | 90      | 88 C.        |
| 68         | 3447         | 19   | 0 1   | Ditto                             | 95    | 82      | 100 C.       |
| 69         | 3476         | 12   | 0 1   | Resection nasal sept.             | 20    | 82      | 94 C.        |
| 70         | 3492         | 15   | 0 1   | Tubercular glands of neck         | 35    | 78      | 84 C.        |
| 71         | 3508         | 32   | 1 0   | Ditto                             | 30    | 84      | 82 I. (e)    |
| 72         | 3514         | 16   | 0 1   | Ditto                             | 76    | 84      | 100 I.       |
| 73         | 3518         | 20   | 0 1   | Ditto                             | 60    | 90      | 120 I.       |
| 74         | 3547         | 35   | 1 0   | Mastoid for ch. otitis            | 45    | 91      | 76 C.        |
| 75         | 3556         | 13   | 1 0   | Tubercular glands of neck         | 60    | 96      | 100 C.       |
| 76         | 3579         | 12   | 1 0   | Ditto (right)                     | 50    | 90      | 102 C.       |
| 77         | 3579         | ...  | ...   | Ditto (left)                      | 45    | 72      | 116 C.       |
| 78         | 3590         | 15   | 1 0   | Hare lip                          | 20    | 78      | 82 C.        |
| 79         | 3638         | 25   | 0 1   | Osteomyelitis elbow               | 40    | 97      | 106 I. (l)   |
| 80         | 3688         | 20   | 1 0   | Double hare lip                   | 45    | 88      | 90 I. (l)    |

C.=cured.

I.=improved.

N. I.=not improved.

D.=death.



gone within 48 hours. The patient improved and the left side (series No. 60) was operated three weeks later without any sign of shock, although this was also a long operation, 120 minutes. Finally, a fortnight later, under ether inhalation the large mass of glands in the right axilla was removed. This required 50 minutes. By way of comparison it is interesting that this time the patient again had a rapid pulse, 140, on leaving the table; so that rectal ether is fairly to be exonerated as the cause of shock in the previous operation.

(1) Still under treatment.

**General:**—Forty of these patients suffered from tubercle, mostly glands of the neck, the majority requiring long operations for a thorough eradication of the disease. In some, the lungs were affected. It was desirable to irritate the latter as little as possible, and it was distinctly observed that with rectal anæsthesia bronchial irritation was less than with ether inhalation—by the open method as we are accustomed to use it.

Ether, being less toxic than chloroform, is considered the anæsthetic of choice for these lung operations in debilitated patients.

It is found that about as much, perhaps a trifle less, ether is used when given per rectum as by inhalation, in long operations.

Post-operative vomiting was somewhat less frequent after use of the rectal method.

**Mortality:**—In these two series, totalling 82 operations, five deaths are recorded, or about 6 per cent. This is a much higher mortality than is shown in our records of the past two years for the total of 872 major operations (of which 347 were abdominal sections), the percentage of fatalities being 3·4 per cent. However, it is difficult to prove that the method of anæsthesia is to blame for the difference. Prolonged operations about the head and neck, especially in patients weakened by chronic disease, must be considered somewhat worse risks than the average for major surgery. If the two cases in the first series be excluded, the death-rate in the 80 tabulated operations stands at 3·75 per cent.

THE METHOD OF GIVING ETHER BY RECTUM.

I. Weigh the patient.

II. Clear the bowels by cathartics and a saline enema.

III. Give hypodermically, morphine gr. 1/6 and atropine gr. 1/150, one-half to one hour before operation.

IV. (Instead of III) Induce primary anæsthesia by chloroform inhalation and proceed at once with:—

V. (1) R

|           |     |          |
|-----------|-----|----------|
| Ether     | ... | 3 parts. |
| Olive oil | ... | 1 part.  |

Mix, and let there be a quantity sufficient to give one ounce of the mixture for every 20 lbs. weight of patient.

Shake thoroughly in a stoppered bottle for one minute; then introduce into rectum through a small oiled catheter, having a funnel, at the rate of 1 ounce per minute (patient's hips being preferably slightly raised) until entire quantity is given. Withdraw the catheter forthwith and maintain pressure on the anus with a firmly rolled bandage.

(2) For *delayed anæsthesia*, say, more than 20 minutes (when procedure III is used instead of IV), place a wet towel over face, or give more ether or chloroform by inhalation.

(3) For *prolonging or deepening anæsthesia* after some time, it will generally be necessary to give another ounce or so of the mixture by rectum, or to give a little ether or chloroform by inhalation.

(4) For *overdose*, lower the hips (if raised) and draw off the mixture from the rectum with a rectal tube having several openings. This mixture may be saved for reintroduction in the same patient when the danger has passed.

(5) For *cessation of anæsthesia*, proceed as in (4). In addition it may be best to wash out the lower bowel with one pint of soapy water.

**NOTE:**—The ether-oil mixture is not irritating, if given as stated. In fact it can be given to a patient in his or her bed by the nurse (if procedure III has been followed) and the patient becomes anæsthetized without realizing that he or she is being given an anæsthetic. The method is thus well-nigh ideal for cases with hyperthyroidism, or other nervous patients. Except in such cases, we, here, prefer to begin anæsthesia by chloroform inhalation (procedure IV), as this saves time—an important factor not infrequently.

SUMMARY AND CONCLUSION.

Rectal ether has proved, in the 82 operations for which we have used it, a safe and satisfactory method of general anæsthesia, when intestinal lesion cases are excluded.

It is not suitable for laparotomies.

It is particularly convenient for surgery of the mouth, head, neck, or other regions above the diaphragm.

It is not economical for operations that can be performed in less than 30 minutes.

It is almost ideal for nervous thyroid cases, or others who dread inhalation anæsthesia.

There is less hyperæmia about the head and neck, consequently less hæmorrhage with this method.

It is less irritating to the lungs than is ether given by the open method, probably because it reaches the lungs in a naturally warmed and dilute condition.

There is less post-operative nausea and vomiting than with inhalation anæsthesia.

These observations agree closely with those recorded by Lumbard in May, 1915.\*

\* Surgery, Gynecology, and Obstetrics, May 1915, page 553.

## The Combined Treatment of SYPHILIS.

## SUPSALVS

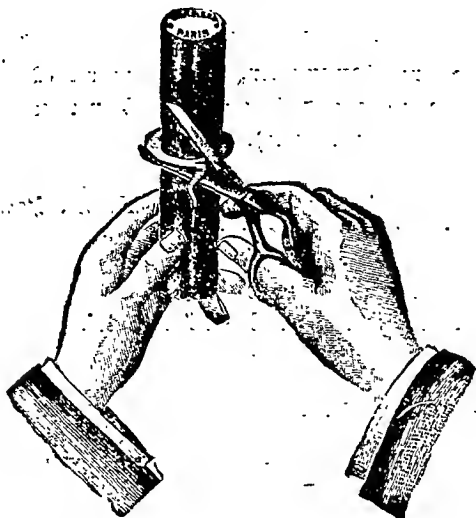
STABLE SUPPOSITORIES OF  
"606" (of French Manufacture)

Fig. 1.

Fig. 1 represents the special patent metallic envelope containing a Supsalv for hot climates. The projecting edge in the middle is cut by scissors—the two ends are then easily pulled apart. The envelope should first be immersed in cool or iced water for 10 minutes.

At the International Congress of Medicine Ehrlich stated that the biochemical action of "606" on spirochaetes is not direct but indirect, a third factor found in the body fluids being necessary.

This success is explained by the well-known experiment of Levaditi: "If living treponemas be placed in a solution of Arsenobenzol (Ehrlich's 606) they continue to live in it. But if a trace of extract of liver be added to the mixture the treponemas are destroyed."

"If 606 has to be taken up and transformed by the liver in order to become toxic to the treponema, there is no better mode of absorption of the drug than by way of the intestine, since all the veins of the intestines join the portal vein. If this be the case no route could be more indirect and more unsatisfactory for active treatment than one that is not intestinal or not intravenous (i.e., prehepatic), since some of the drug must necessarily become fixed everywhere before the passage through the liver has activated it."—Dr. Sabouraud, La Clinique (13-4-1913).

As a result of numerous clinical experiments, Dr. Bagrov, of Moscow, has arrived at the same conclusion, and recommends the rectal method of administration of 606.

**200** cases were treated by the combined treatment in one of the London hospitals. In each case a negative reaction was attained.

Extremely Simple in  
use.

No Ill-effects.

Most Satisfactory  
Clinical Results.

Rapid Absorption.

## MERSALV

FOR MERCURIAL INUNCTION IN  
CONNECTION WITH SUPSALVS  
TREATMENT.

**CHEMISTRY.**—"Mersalv" contains 10 per cent. metallic mercury, which by a special mechanical process exists in the minutest state of sub-division possible. It is a non-greasy preparation, and, in contra-distinction to other mercurial preparations, contains no organic fats or oils. "Mersalv" is of a white creamy consistence, of pleasant odour, and *cleanly in application*.

In Special Glass Stoppered Bottles for Hot Climates.

## IODOGENOL

IODINE in Its Most Reliable and Palatable Form.

IODOGENOL is a preparation containing Iodine in an organic, assimilable and one might almost say "living" form.

IODOGENOL possesses about 38 times the physiological activity of that of iodide of potassium, this preparation has, according to the clinical reports of eminent professors, succeeded where the usual iodide treatment had failed after producing undesirable by-effects.

IODOGENOL does not produce Iodism, or other bad symptoms.

IODOGENOL is an undoubted digestive stimulant and promotes appetite and has a markedly beneficial effect on the general nutrition. It has been tried in many of the large hospitals, and given highly satisfactory clinical results in cases of

Syphilis, Rheumatism, the various phases  
of Tuberculosis, General Debility, etc.

20 minims of IODOGENOL are equivalent to 8 grs. Iodide Potassium.

## BIOSULFOL

(Assimilable Colloidal Sulphur.)

A Great Advance in Sulphur Treatment.

Sulphur administered in this form by the digestive tract is entirely absorbed (90% in worst cases and 100% in others).

Biosulfol gives beneficial results with which ordinary Sulphur medication, owing to its being only in a small part assimilated, cannot compare.

## INDICATIONS:

Chronic Affections of the Pharyngeal and Bronchial Mucous Membrane.  
Chronic Affections of the Genital Mucous Membrane.  
Chronic Rheumatism (Polyarthritis deformans).  
Various Affections of the Joints.  
Intestinal Intoxication.  
Skin Diseases.  
Mercurial and Lead Poisoning, etc.

## DOSAGE:

Biosulfol is prescribed in a one-teaspoonful dose, to be taken during each of the two principal meals, pure or in water or milk. It is quite palatable.

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Antipyrin, Phenacetin, and Pyramidon  
superseded.

## CRYOGENINE

LUMIÈRE.

**NON-TOXIC. EFFICACIOUS. HARMLESS.**

Adopted by the French Ministries for War and the Navy, also by the Poor Relief Board. Papers on "Cryogenine" have been read before various Medical Societies by over 90 of the most eminent Continental Medical Men. In each paper clinical results of the most satisfactory character are recorded. "Cryogenine" is a white crystalline powder, odourless and almost tasteless; its chemical composition is Metabenzamido semi-carbazide.

Cryogenine has a high reputation as a

**GENERAL ANTIPYRETIC and POWERFUL ANALGESIC.**

FORMS.—Tablets, Pills and Powder.

LANCET, Dec. 18th, 1909, p. 1812: "..... The above case is one out of a number of successful results obtained from the use of this remedy (Cryogenine) contrasted with Pyramidon, which certain writers regard as the best drug for phthisical temperature. I think there can be little doubt 'Cryogenine' is the safer and more efficacious antipyretic....."

J. E. G——, M.D.

**A Great Advance in the Treatment of BURNS—Slight or Severe.**

## AMBRINE

(Method of Dr. BARTHE DE SANDFORT.)

AMBRINE instantly alleviates pain.

Promotes rapid healing.

Forms a sure protection against infection of the Wound.

Although the dressing with AMBRINE is seclusive and adhesive, it becomes after a short period non-adhesive, and can be removed without pain, hæmorrhage, or injury to the newly-formed tissues. The healing takes place without leaving scars or contractions.

**Supplied to** The British Navy. British Red Cross. Many Ordnance and other large Works. The French Ministry of War and Marine. The French Red Cross. The Italian, Belgian, and Rumanian Governments. The French Railway Companies. The Carnegie Trust Company, U.S.A., &c.

### INDICATIONS:

|           |            |                 |
|-----------|------------|-----------------|
| BURNS     | CHILBLAINS | VARICOSE ULCERS |
| NEURALGIA | SCIATICA   | NEURITIS        |
| PHLEBITIS | RHEUMATISM | GOIT, &c.       |

The British Medical Journal, Sept. 2nd, 1916.

Re AMBRINE TREATMENT.

"..... The primary and quite incontestable advantages of the treatment are two: it is agreeable to the patient because entirely painless; it is convenient to the surgeon because easily and quickly applied..... It is possible that the treatment would be useful in dealing with ordinary ulcers and in any case it is certain that the study of its application to the raw surfaces is worth pursuing....."

The SCIENTIFIC TREATMENT of HAY  
FEVER and allied ailments.

## KINECTINE

According to Dr. MOUNEYRAT, the discoverer of Galyl and Hectine (the widely adopted Salvarsan Substitutes).

### FORMULA:

Chlorhydrate of Quinine c. Hectine—i.e., Benzo-sulfone-para-amino-phenyl-arsenate of Quinine.

Non-toxic, produces no ill-effects.

Easily taken (tablets) and well tolerated.

Highly satisfactory clinical results:—

**AS A PROPHYLACTIC AGAINST HAY FEVER, &c.**

**RAPID ABORTIVE ACTION IN THE INITIAL STAGES.**

**CURATIVE ACTION IN THE ADVANCED AND CHRONIC CONDITIONS.**

## NEOCAINE-SURRENINE

Neocaine is a synthetic product of French manufacture.

**A Perfect COCAINE SUBSTITUTE of Low Toxicity.**

**A White Powder, readily soluble in water. Analgesic power, duration, and rapidity of action quite equal to Cocaine.**

**Toxicity less than one-sixth.**

**Therapeutical effects identical with Cocaine (excepting as an exhilarant) for Dental or Surgical local and Spinal Anæsthesia, Lozenges, Snuffs, Ointments, &c.**

### Composition of Neocaine-Surrenine:

|                                     |     |     |          |
|-------------------------------------|-----|-----|----------|
| Pure Neocaine                       | ... | ... | 5 c.g.   |
| Acid Borate of Adrenalin (Takamine) | ..  | ... | 0.1 m.g. |

Pure Neocaine is also supplied.

FORMS.—Powder in capsules and phials. Ready prepared solutions in Ampoules (various percentages), and Ampoules of sterilised liquid for making solutions.

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# IODARGOL

Special Colloidal Iodine.

NON-TOXIC  
PAINLESS

FOR THE TREATMENT  
of Gonorrhœa: Acute and  
Chronic. Urethritis: Of  
Old Standing.

DIFFUSIBLE  
ANTISEPTIC  
ANALGESIC

Cystitis and the Serious Complications of Gonorrhœa.  
In Ampoules and Phials for Injection or Soluble Bougies.

## FOR GYNÆCOLOGY OVULES

UTERO-TOPIQUE  
IODARGOL. Direct Intra-  
uterine Medication.

These are introduced into  
the vagina and slowly dis-  
charge the Iodine which  
penetrates deeply into the  
vaginal mucous membrane,  
giving rapid relief from con-  
gestion and pain. Destructive  
to the micro-organisms.

As a wound dressing Iodargol on account of its antitoxic and  
dermoplasto action prevents or ameliorates the fever due to infection,  
cuts short suppuration, eliminates the sloughing portions and cleans  
the wound at the same time stimulating epidermisation and  
electrification.

IODEOL OVULES for Vaginitis, Metritis, etc.

IODEOL CAPSULES contain 4 grains of Iodine in each.  
Never cause Iodism.

*More powerful and active than Iodine without its  
drawbacks.*

New Complete Gynæcological Dressing

# TAMPOVULES

A soluble ovule combined with a Vaginal Tampon

1. The method is strictly aseptic, and offers to the practi-  
tioner every guarantee, the cost being no higher than that of  
any of the well-known brands of ordinary ovules.

2. The ovule and the tampon requisite for keeping it in  
place are applied in a single manipulation. The ovule can  
be applied to the selected point very readily.

3. The ovule is kept at the level to which it has been  
introduced during the whole of the time necessary for its  
solution, and, consequently, the active principles that it con-  
tains are utilized to their fullest extent.

4. Owing to its more prolonged sojourn in contact with the  
mucous membrane, the action of the drug is more energetic.

The base of the ovules consists of selected sterilized  
gelatine. The tampon is soldered to the ovule and consists  
of sterilized cotton-wool covered by sterilized gauze. It may  
be impregnated with active substances which render the  
dressing more efficacious.

The following Tampovules are kept ready in stock; but  
we are prepared to supply similar dressings according to any  
prescription our medical clients may desire.

|                       |                      |
|-----------------------|----------------------|
| Tampovules containing | Argyrol.             |
| "                     | Collargol.           |
| "                     | Hamamelis (Extract). |
| "                     | Ichthyol.            |
| "                     | Iodoform.            |
| "                     | Resoreine.           |
| "                     | Copper Sulphate.     |
| "                     | Zinc Sulphate.       |

In Boxes containing six Tampovules.

# URASEPTINE

*The Most Powerful and Effective  
Urinary Antiseptic.*

URASEPTINE is a granulated product entirely  
soluble in water, its bases being Piperazine, Urotropine,  
Helmitol, Benzoates of Sodium and Lithium. It contains 60  
centigrams (10 grs.) of active matter to each teaspoonful.

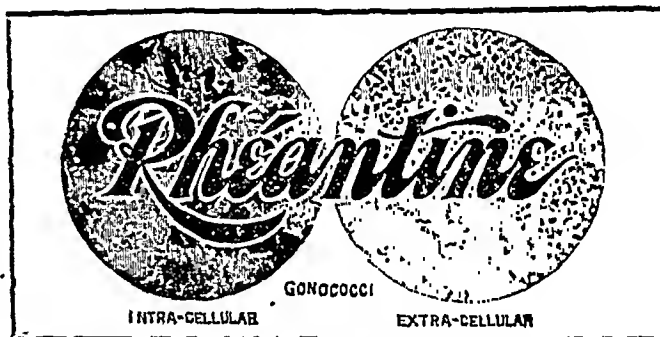
DOSE.—2-6 teaspoonfuls daily.

It purifies the Urine, and this action is due to its three  
principal properties:

1. It is a URINARY ANTISEPTIC.
2. A SOLVENT of URIC ACID and of  
PHOSPHATES.
3. A MILD NON-TOXIC DIURETIC.

INDICATIONS.—Arthritism, Gout, Gravel, Hepatic and  
Renal Colic, Rheumatism, Calculus, etc., Phosphaturia  
Urinary Antisepsis, Pyelitis, Bacteriuria, Cystitis, Prostatitis  
Urethritis, Pyuria, Urinary Abscess, Vesical Catarrh, etc.

## ANTIGONOCOCCIC



The clinical reports given by various doctors show that  
Rhéantine gives highly satisfactory results, both in acute  
and chronic forms of Gonorrhœa and also in the various  
infectious complications due to Neisser's bacillus.

Rhéantine is put up in hermetically sealed tins, containing  
28 spherules. Dosage.—4 spherules a day.

Therapeutic Association of Paris (14th June, 1916) the result of  
their observations:—

"It is not a rare thing," write these authors, to observe in the  
very first days a more or less marked recrudescence of the  
discharge. This negative phase, which, however, is temporary,  
is always followed by a well-defined positive phase, in the course  
of which the characteristics of the urethral pus undergo a rapid  
change; the discharge, which is at first thick, abundant, and  
creamy, passes gradually into the hyaline state, diminishes in  
quantity, and in the majority of cases ceases.

"Under the microscope these successive stages are demonstra-  
ted in equally definite stages; whatever may have been the  
duration of the disease, the characteristics of the pus become  
rapidly modified; after two or three days' treatment the gono-  
coccus, first intracellular, becomes exterior; it ceases to act as a  
parasite on the polymuclear leucocytes and the large epithelial  
cells—one then finds them disseminated outside the leucocytes.

"Finally, some days later, if the administration of Rhéantine  
is continued, the condition undergoes still further change, the  
gonococci become agglutinated, arranged in a mass, and finally  
bacteriolysed."

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# SERUMS

OF THE MERIEUX INSTITUTE LYONS, FRANCE.

Prepared under the immediate supervision of M. Merieux (late of the Pasteur Institute) by the most approved modern scientific methods.

## INALTER VIAL



### DIRECTIONS:

Fig. 1, A, represents the "INALTER" Vial—with U tube inside containing 1 gramme of dried serum and 9 c.c. carbolised water (1 gramme dried serum = 10 c.c. liquid serum). The rubber plug which seals the Vial and the U tube is withdrawn and after the contents of the tube have been emptied into the solution, the plug is replaced in Vial, and the contents quickly dissolve. The freshly prepared serum is now ready for use as in Fig. 1, B.

### ADVANTAGES

The contents keep indefinitely.

The preparation of the Serum is speedy, simple, and perfectly aseptic.

The Inalter Vial can be supplied with:—Serum Antistreptococcus—Antitetanic or Antidiphtheritic.

Ready for use whenever required.

The freshly prepared Serum has full potency and activity.

## THE MEDICAL TREATMENT OF CANCER.

# CUPRASE

CUPRASE is a colloidal copper hydroxide which is obtained chemically by the reduction of salts of copper in the presence of albuminosio acid.

As a result of over ten years' research work on Cancer Dr. Gaube du Gers produced a new Colloidal Copper Hydroxide which has given remarkable results in arresting the progress of the disease, with loss of pain, and great improvement in the general condition of the patient.

This treatment has passed far beyond the experimental stage. The numerous clinical reports from Doctors of repute in various countries, give cases of great variety. In all of these pain has been eliminated, and in a great percentage cures are claimed; in no instance any undesired effects.

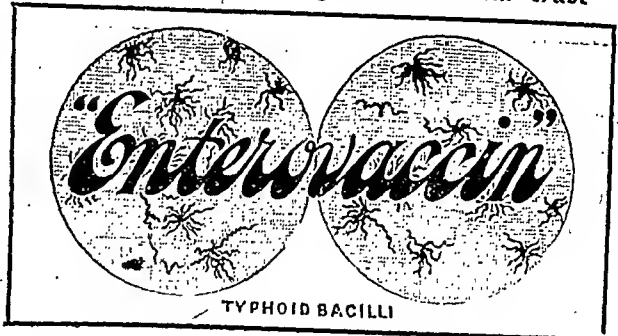
*Extract from Proceedings of the Royal Society of Medicine, February, 1913.*

Dr. George Herschell, comparing electric and chemical colloid copper, stated: "..... Chemical colloid appears to give the best results. In the following cases chemically prepared colloid was used. Experimentally it has been proved: (1) That particles of colloid copper can be demonstrated in the granulations of cancerous growths after two or three injections of the colloid; and clinically (2) There is invariably great relief from pain; (3) Appetite and strength return and the patient puts on flesh; (4) There is in many cases a diminution in the size of the tumour; (5) The injections are absolutely non-toxic, although in many cases an inflammatory reaction is manifested in the cancerous growths.

"As regards my own personal experience in the use of this method of treatment in addition to my own cases, I have had an opportunity of observing the effects in the practice of some of my medical friends, and in nearly all cases the progress of the disease appeared to be arrested."

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1. No one who has been treated with **Enterovaccin** has been attacked by typhoid fever.
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Enterovaccin is put up in hermetically sealed tins containing 28 spherules, sufficient for a complete treatment (one week). Each spherule contains per milligramme: 300 millions Eberth bacilli. 180 millions coli bacilli. 120 millions paratyphoid bacilli.

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Perfectly tolerated. Never causes Iodism.

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INJECTION**

for  
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—Simple and Infective  
and  
Broncho-Pneumonia.

Bronchitis.  
Pulmonary Congestion.  
**TUBERCULOSIS, &c.**

**By the Mouth (Capsules):**

Syphilis, or wherever Iodides are indicated. Iodeol is ten times more active and does not cause Iodism.

**Externally (Liquid):**

Contains 50 per cent. Colloidal Iodine (must not be used for injection), ten times more active than painting with Iodine tincture—does not produce erythema or irritation. Absorption is extremely rapid.

**For Gynaecology (Ovules):**

These are introduced into the vagina, slowly discharge the iodine which penetrates deeply into the vaginal mucous membrane, giving rapid relief from congestion and pain.

Destructive to the micro-organisms.

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# Indian Medical Gazette.

JANUARY.

## ANNUS MEDICUS.

THE shadow of the war has been over the whole Empire, and it has not been a year in which one would expect many new advances or discoveries. The whole world of science is devoted rather to devising methods of destruction rather than construction, and this must be so till German pride and power has been humbled.

We can, however, report much of interest during the year. Our pages have contained many columns of military medical interest, but we would welcome many more. The reports of a medical society in besieged Kut and in Waziristan are of special interest, and doubtless there are many other unrecorded meetings of this sort. Colonel Giffard's paper on medical organisation in France was one of special value.

Among the subjects of interest dealt with in these columns are of course cataract, but we have missed the virile pen of Lt.-Col. Henry Smith; several good surgical papers have appeared (Barber, Neve and Wanless), more than one paper has called attention to the disease known as ulcerating granuloma; kala-azar and the form of leishmaniasis known as "frontier sores" have received much attention from Sir L. Rogers, Dr. E. Muir, Dr. Brahmachari, Major L. Bodley Scott, and Capt. Sinton, and it is clear that for the past two years antimony has been the fashionable drug.

Reports of the intravenous use of the gynocardates are more than encouraging in the treatment of leprosy. The subject of hookworm has received much attention, and good work has been reported by Lt.-Col. Clayton Lane. So far possibly the greatest advance has been in the convincing of employers of labour like tea garden managers, that it *pays* to free the coolie from hookworm infection. We have also published papers on the life-history of the ascaris round worm, and reported cases from Kathiawar of hydatid disease, rare in other parts of India.

A medical congress at Bombay for the discussion of means of combating venereal diseases must be recalled, the subject of medical aid in

rural areas has come up again, and we are glad to see a considerable opposition to the proposal to educate a cheaper and lowlier form of medical practitioner.

The Sir L. Rogers' portrait fund has been closed, and the eminent sculptor, Mr. Mhate, has produced a very admirable likeness of Sir Leonard for the Tropical School of Medicine, which only waits for a staff to begin its good work.

The eternal subject of quinine, and the best way of using it, has been discussed, and the hypodermic injection has been condemned, less on account of the exaggerated danger than on account of its being less useful. In this connection we may mention a short-lived alleged "specific" for malaria. This crude combination of drugs had a short life, and even a backing up from the editor of *Truth* will not persuade medical men of its special value.

The most important service occurrence during the year was the publication of the Report of the Public Services Commission. It is not to be expected that all the recommendations of this commission can now be carried out, but the whole future of the civil side of the service is dependent upon a wise use being made of them, and the Government of India have taken up the matter as an urgent question within the past month.

The civil side of the I. M. S. has always been the most important and attractive, and if one thing is certain, it is that the events of the great war have shown the absolute necessity of a large civil side for the purpose of providing a trained medical reserve for the army. Considerable changes and improvements in the military side of the I. M. S. are necessary, and must come soon; and though the I. M. S. had but little to do with the plans for the medical organisation which broke down in Mesopotamia, it got a more than fair share of ill-informed criticism.

Among the books published by medical men in India or of the Indian Services during this year have been Capt. Russell's new edition of McNally's Sanitary Handbook for India, a standard work; Major Walter's new book on X-Rays and Radium Therapy; Brahmachari's book on Kala-Azar; Lt. Colonel Elliot's book on the Indian Operation of Couching for Cataract; and MacCarrison's fine treatise on the Thyroid Gland and its Functions.

The year that has passed has taken a heavy toll. Many well-known medical officers of the past and present generation have passed away. On service we have lost Colonel Grayfoot, Lt.-Colonel Horton, Capt. Husband, Capt. Bharucha. It is among the older retired men that death has been especially busy. We have lost men like Sir George Birdwood, Sir Benjamin Franklin, Sir Alfred Lethbridge, Surgeon-Major Barstead (one of the two surviving I. M. S. Crimean veterans), Deputy Surgeon-General Fairbrother, Deputy Surgeon-General Williamson, Brigade-Surgeon MacRory, Surgeon-Major W. Napier Keefer, Surgeon-Colonel J. G. Pilcher, Lieutenant-Colonel J. Davidson, and Brigade-Surgeon G. E. Seward. Among the men better known to the present generation, there have gone Lieutenant-Colonel A. W. D. Leahy, Lieutenant-Colonel Ernest Hudson, Colonel T. H. Hendley, C.I.E., Brigade-Surgeon S. C. Amesbury, Lieutenant-Colonel Miller Thompson, Lieutenant-Colonel J. A. Nelis, Lieutenant-Colonel F. L. Swaine, Lieutenant-Colonel Sarkies, Lieutenant-Colonel Kirtikar, Lieutenant-Colonel J. S. Wilkins, and Lieutenant-Colonel Fred. F. MacCartie, and on October 23rd we lost the head of the Department by the death of Sir Charles Pardey Lukis, and in Christmas week it was announced that the new Director-General would be Surgeon-General W. R. Edwards, C.B., C.M.G., I.M.S., an excellent and widely popular choice.

## Current Topics.

### WAR SERVICES, PENSIONS, AND ALLOWANCES.

THE following article is taken from *The Lancet* (September 22nd, 1917), and will be found to contain a vast amount of useful information about pensions, grants, and allowances to medical men employed on war service:—

#### WAR SERVICE AND THE MEDICAL MEN: PENSIONERS, GRANTS, AND ALLOWANCES.

We have put together in concise form the various means through which the medical man, who has entered either the Navy or Army, is compensated for invalidism or loss of professional income, while the case of his death on service is considered in respect of pensions to widows and children. The new Royal Warrant is placed first, as it is not merely the most important organisation, but is part of the ordinary terms of agreement between employer and employed. Various agencies follow, applicable in greater or lesser degree in different circumstances, and the source of further information if required is given in each case. The War Emergency Fund of the Royal Medical Benevolent Fund is placed last but one, as its intention is avowedly to supplement and fill in the gaps of the other agencies; the Medical Patriotic Fund of the British Medical Association last of all, as the fund is only to be instituted if others fail to co-operate or amalgamate.

#### MINISTRY OF PENSIONS: THE ROYAL WARRANT (July 1917).

*Object.*—The draft Warrant issued by the Minister of Pensions in July deals with the retired pay of disabled officers (naval or military) and with the pensions of the families and relatives of deceased officers, with effect from April 1st, 1917, and the option of further retrospective effect if more favourable to the officer than his present retired pay. The actual schedules are given as follows:—

#### (1) Retired pay to Disabled Officers.

| Degree of disablement. | Percentage degree of disablement. | RETIRED PAY ON ACCOUNT OF DISABLEMENT.                        |                    |          |                     |        |  |   |
|------------------------|-----------------------------------|---|--------------------|----------|---------------------|--------|--|---|
|                        |                                   | Officers not holding permanent commissions in Regular Forces. |                    |          |                     |        |  | Officers holding permanent commissions in Regular Forces. |
|                        |                                   | Major-General.  | Brigadier-General. | Colonel. | Lieutenant-Colonel. | Major. | Captain, Lieutenant, or Second Lieutenant. | All ranks.  |
|                        | Per cent.                         | £   | £ s.               | £ s.     | £                   | £ s.   | £ s.                                       | £   |
| 1                      | 100                               | 350   | 325 0              | 275 0    | 250                 | 225 0  | 175 0                                      | 100   |
| 2                      | 80                                | 280   | 280 0              | 220 0    | 200                 | 180 0  | 140 0                                      | 80  |
| 3                      | 70                                | 245   | 227 10             | 192 10   | 175                 | 157 10 | 122 10                                     | 70  |
| 4                      | 60                                | 210   | 195 0              | 165 0    | 150                 | 135 0  | 105 0                                      | 60  |
| 5                      | 50                                | 175   | 162 10             | 137 10   | 125                 | 112 10 | 87 10                                      | 50  |
| 6                      | 40                                | 140   | 130 0              | 110 0    | 100                 | 90 0   | 70 0                                       | 40  |
| 7                      | 30                                | 105   | 97 10              | 82 10    | 75                  | 67 10  | 52 10                                      | 30  |
| 8                      | 20                                | 70  | 65 0               | 55 0     | 50                  | 45 0   | 35 0                                       | 20  |

In addition to retired pay under Royal Warrant of Dec. 1st, 1914.

(2) *Pensions, Gratuities, and Allowances to Officers' Widows and Children.*

| Rank.                   | Widow's pensions. |      | Widow's gratuity. | Children's allowances. |     |
|-------------------------|-------------------|------|-------------------|------------------------|-----|
| (1)                     | (2)               | (3)  | (4)               | (5)                    | (6) |
| Field Marshall ...      | £800              | £600 | £3,500            | £300                   | £25 |
| General ...             | 600               | 450  | 3,000             | 30                     | 25  |
| Lieutenant-General ...  | 500               | 375  | 2,000             | 30                     | 25  |
| Major-General ...       | 400               | 300  | 1,100             | 30                     | 25  |
| Brigadier-General ...   | 300               | 225  | 900               | 30                     | 25  |
| *Colonel ...            | 200               | 150  | 600               | 24                     | 20  |
| †Lieutenant-Colonel ... | 180               | 135  | 450               | 24                     | 20  |
| Major ...               | 140               | 105  | 300               | 24                     | 20  |
| Captain ...             | 100               | 75   | 250               | 24                     | 20  |
| Lieutenant ...          | 100               | 75   | 140               | 24                     | 20  |
| Second-Lieutenant ...   | 100               | 75   | 100               | 24                     | 20  |

\* Colonel means an officer who has been employed in the rank of Colonel. † Including a Colonel not employed as above.

*N.B.*—Whether pension is granted to the widow on scale (2) or (3), and whether the gratuity (4) is added, depends on the particular circumstances attending the officer's death, and the same consideration applies to the additional children's allowance (6). Allowances are continued up to the age of 18 in the case of sons (with extension for purposes of education or apprenticeship) and to the age of 21 in the case of daughters.

*Conditions.*—Retired pay at temporary rates is given until disablement has reached its final condition, and a permanent pension then awarded cannot be subsequently altered to the officer's disadvantage. During special treatment pay at the highest degree of disablement may be received. In the case of total disablement the officer requiring the constant attendance of a second person may receive an additional allowance of £78 a year. When the degree of disablement is less than 20 per cent. a gratuity not exceeding £500 may be granted in lieu of retired pay.

## MILITARY SERVICE (CIVIL LIABILITIES) COMMITTEE.

*Object.*—To grant pecuniary assistance to men, married or unmarried, serving with H. M. Forces who are unable by reason of undertaking military service to meet their financial obligations.

*Benefits.*—Applicants must not hold a commission, and must be ordinarily resident in the United Kingdom. Assistance is granted in respect of rent, interest and repayment of loans, instalments under agreements of purchase, rates and taxes, insurance premiums, school fees, but is not available for ordinary debts.

*Amount.*—Not to exceed £104 per annum (= £2 a week) paid quarterly.

*Conditions.*—The assistance may not be assigned and is liable to revision or withdrawal at any time. It ceases on discharge from the Forces. In case the grantee is reported dead or missing the assistance may be continued for 26 weeks to his widow or dependents.

*Application.*—Commissioners have been appointed for 45 districts in England, 3 in Wales, and 18 in Scotland. A list of addresses can be inspected at any post-office. Application should be made to the Commissioner for the district in which the applicant or his family resides, on a form obtainable at the post-office.

## PROFESSIONAL CLASSES WAR RELIEF COUNCIL (INC.).

*Object.*—To assist the families of professional men whose circumstances have been adversely affected by the war. Those serving with H. M. Forces (without holding commissions) are advised to confer first with the Civil Liabilities Committee.

*Benefits.*—When granted these have been of a substantial character. Up to the issue of the last report assistance had been granted to the extent of £10,851 for the education of 631 children, 256 babies had been born in the maternity home, and 103 candidates helped with their training at a cost of £1,300.

*Application.*—The central office of the Council is at 13-14, Princes Gate, S. W. 7 (Tel. Kensington 6394/5). Chairman: Major Leonard Darwin. Chairman of executive: Dr. S. West. Honorary secretaries: Theo. G. Chambers, Alex. Goddard. Secretary: Miss Percy Tailor. Interviews by appointment only. There are eight members of the medical profession on the Council—namely, Sir Thomas Barlow, Lady Barrett, Sir Francis Champneys, Sir Watson Cheyne, Dr. G. Newton Pitt, Mrs. Scharlieb, Sir Frederick Taylor, Dr. S. West.

## OFFICERS' FAMILIES FUND.

*Object.*—To assist the wives and other dependent relatives of officers in the Navy and Army (including Service Battalions, the Territorial Forces, Indian Army, and Colonial Forces) who find themselves in financial embarrassment or other trouble owing to direct or indirect expenses resulting from the war.

*Benefits.*—Assistance is provided in the form of (1) money; (2) medical assistance, with the co-operation of doctors, nurses, and maternity homes (Florence Nightingale Hospital, Lisson Grove); (3) education, already given to 475 girls and boys (honorary secretary, Mr. E. H. Parry); (4) clothing depôt for men at 2, Albert Gate, S. W. 5; for women and children at 29, Berkeley Square, W. 1, managed by Lady Wilson; (5) business advice (chairman, Lord Justice Warrington; 2,000 personal interviews have been given); (6) employment. During the two years 1914-16 in all 9,506 grants have been made, amounting to nearly £200,000, while 476 widows and 172 mothers have been assisted.

*Application.*—The central office of the Fund is at Lansdowne House, Berkeley Square, W. 1. Honorary secretary, Countess Roberts. Secretary, Miss H. M. Kelly. Interviews 11-1 (except Thursday and Saturday), or by appointment.

## AUXILIARY R.A.M.C. FUNDS.

*Object.*—(a) Officers' Benevolent Branch: To assist the orphans of commissioned officers of the three auxiliary branches of the R.A.M.C.—viz., the Special Reserve, the Territorial Force, and the New Armies—serving during the present war. (b) Relief Branch: To assist the widows and orphans of the rank and file of the same branches. A similar Fund has existed since 1820 in the regular R.A.M.C.

*Benefits* (of the Benevolent Branch).—Relief is given in respect of each orphan up to a maximum of £40 in a year, and to the age of 21 years (boys) or 18 years (girls). A female orphan has a claim if over 50 years and unmarried, or at any age if unfit. Loss of both parents constitutes a superior claim for relief, and priority is given to the relatives of officers killed in action, or who died of wounds or disease caused by active service. Donations are given, not annuities.

*Application.*—The office of the benevolent branch is at 124, Victoria Street, S. W. 1 (Tel. Vict. 2722). President, Sir A. Keogh. Chairman, Major Ewen Maclean. Secretary, Lieutenant-Colonel E. M. Wilson. Application should be made on or before July 1st in any year, the distribution taking place annually in October.

## SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.

*Object.*—To provide for the necessitous widows and orphans of its members.

*Conditions of membership.*—Membership is open to any registered medical practitioner resident at the time of his election within a 20-mile radius of Charing Cross. The annual subscription is £2 2s. Relief is granted in respect of life members and those of three years' standing.

*Benefits.*—A widow with an assured income of less than £100 a year receives £50 annually, plus £43 a year for each orphan up to 16 years of age. The Copeland and Brickwell Funds permit of further grants in special cases. In the year 1916 £4,223 odd was distributed, and on the



last day of the year 48 widows and 9 orphans were in receipt of grants.

*Application.*—Secretary, 11, Chandos Street, Cavendish Square, W. 1.

#### WAR EMERGENCY FUND OF THE ROYAL MEDICAL BENEVOLENT FUND.

*Object.*—A special department of the Royal Medical Benevolent Fund to afford assistance to members of the medical profession who find themselves in temporary difficulties, consequent on having joined the Army Medical Service.

*Benefits.*—Grants on a liberal scale will be made in respect of rent, insurance, taxes, family maintenance and education, in so far as the needs are not met by any other existing fund if the necessary funds are forthcoming.

*Application.*—The office of the Fund is at 11, Chandos Street, Cavendish Square, W. 1, President, Dr. S. West. Honorary treasurer, Colonel Charters Symonds.

#### MEDICAL PATRIOTIC FUND OF THE B.M.A.

At the last Annual Representative Meeting of the British Medical Association a scheme for loan fund for the protection and assistance of those who went to the war and on coming home found themselves in temporary difficulties was brought in by a sub-committee appointed for the purpose. A resolution as follows was passed:—

"This meeting approves the principle of the Medical Patriotic Fund (Loan Fund) Scheme, and instructs the Council to consider and, if approved, to launch the scheme on the cessation of hostilities, or earlier if the need arise unless in the meantime amalgamation or co-operation of existing funds shall render the establishment of an independent fund unnecessary or undesirable.

#### THE INTERNATIONAL HEALTH BOARD.

##### THE ROCKEFELLER FOUNDATION.

It is difficult not to be enthusiastic when one reads of the splendid work done by the International Health Board in many countries in the world. In their third annual report of the calendar year 1916,\* Dr. Wickleffe Rose submits his report as Director-General of this great scheme.

During the year no less than 503,349 dollars, or over one and-a-half million (1,510,047) rupees were spent on the work of this Board, of which more than half was spent on the relief and control of hookworm disease.

Systematic efforts towards control have now been established in eight Southern States and fifteen foreign countries, between 36° of N. latitude and 30° South, i.e., the tropical and sub-tropical belt, which is the habitat of the hookworm. In addition to this, the Board sent out two Malaria Commissions, and two to S. America on yellow fever.

The staff of the Board reports that everywhere it has met with cordial reception and with general co-operation on the part of governments and the medical profession.

The active measures for the control and prevention of hookworm are as noteworthy as they are widespread in the Southern States, as well as in Brazil, Nicaragua, Panama, British and

Dutch Guiana and in West Indian Islands such as St. Vincent and Trinidad.

Many important facts have thus been elicited, e.g., the relation between geological structure and hookworm infection, e.g., in Barbados one portion, composed of porous coral limestone which dries quickly, is unfavourable to the growth of the young hookworm, whereas in another portion of the island, a picturesque highland district known locally as "Scotland," the infection is very heavy, it being estimated that 25,000 persons suffer from it in an area of less than 25 square miles.

Among other points elicited is that of racial immunity, e.g., the Negro-creoles of British Honduras are "clinically" immune, but the other inhabitants—Indians and half-castes (Mestizos) are heavily infected.

Everywhere the dangers of soil pollution is seen, due to primitive and inefficient sanitary conveniences, and the planters in British Honduras have come to realise this fact. Special difficulties arise in places where, like China, human excrement is largely used as a fertilizer.

The plan of work is first to develop interest in the work by the "dispensary plan," and when this has been in working order to start the "intensive plan," i.e., to treat everybody and to try to eradicate the infection permanently.

It is satisfactory to learn that "a measurable reduction in infection has been secured by the dispensary method."

The following figures are significant:—

In these thirty-five counties, 63,882 persons were examined by the dispensary plan. Of these, 37.5 per cent were found to be infected with hookworm disease. At the beginning of the intensive work in the same areas, usually from three to five years after the completion of the dispensary work, 34,727 persons were examined. The infection was found to be 26.5 per cent. Thus, in spite of the opportunities offered over a period of years for cases of new infection or re-infection to arise, it will be seen that the infection recorded in intensive work was 11.0 per cent. lower than that recorded in dispensary work, indicating that as a result of the dispensary work the number of persons infected with the disease was reduced approximately one-third. The method of comparison may be open to error; the number of persons examined and the per cent of decrease are, however, sufficiently large to be significant. A more limited comparison, including only persons who were examined by both methods, indicates that the estimate of reduction is conservative. Practising physicians and field directors state, moreover, that they now encounter but few of the severe cases of infection which were so frequently seen in 1910 and 1911.

Sufficient time has not yet elapsed since the adoption of the intensive method to warrant a tabulation of the percentage of reduction in infection which it has secured. It can reasonably be estimated, however, that this percentage is greater than that secured by the dispensary method. The intensive type of work, like the dispensary, reduces infection through curative measures.

The intensive method, of course, involves the installation, use, and maintenance of adequate latrines, but it produces more permanent results.

\* , Broadway, New York, U.S.A.

The report then goes on to give accounts of the anti-hookworm work done in many countries—but as India is not mentioned (India's efforts though guided by the Board's experiences are under the control of the Scientific Bureau in India), it will be perhaps best to give an account of the International Board's work in 1916—in Ceylon.

During 1916 the International Health Board began active participation in measures for the relief and control of hookworm disease in Ceylon. The work in this colony is conducted as a branch of the Government Medical Department, under the supervision of Dr. G. J. Rutherford, Principal Civil Medical Officer. Control is vested in a local Ankylostomiasis Committee, composed of the Colonial Secretary, the Principal Civil Medical Officer, members of the Estate Agents' and Planters' Associations, and prominent medical men of the colony. Of this Committee the Colonial Secretary is Chairman.

Efforts to eradicate the disease from Ceylon have been made for a number of years. At the time of the visit of the Director-General of the International Health Board in 1914, definite plans for bringing the disease under control were formulated. These plans provided for the work to be conducted entirely by local agencies, the expense to be shared equally by the Government and the planters. Because of conditions growing out of the war, however, this project had to be abandoned soon after it was begun.

Later, on May 26, 1915, during the visit of the International Health Board's Director for the East, arrangements were made for resuming measures for the control of the disease with the co-operation of an officer of the Board. Active work was begun on January 12, 1916. At first the staff consisted of a Director, an Assistant Medical Director, six apothecaries, and one caretaker, with all expenses exclusive of the salary and personal allowance of the Director, borne equally by the government and the planters.

Later, in accordance with a new arrangement made by Dr. H. H. Howard, the Board's Director for the West Indies, who had been delegated to assist in organizing the work in Ceylon, the staff was enlarged to include a Director, an Assistant Medical Director, three junior field Directors (in training), four microscopists, twelve nurses, two clerical assistants, and one caretaker. Six of the nurses speak Tamil and English, and four Sinhalese and English, while two are Moors engaged to handle the Moorish population in the villages. This division represents roughly the proportion of these elements of population. Under the new arrangement, the cost of the work is divided between the Government and the Board. From October 18 until the end of the year, the work in Ceylon was directed by Dr. W. Perrin Norris, Associate Director for the East, with Dr. John E. Snodgrass in direct charge of operations in the field.

The Matale district, located in the central part of the Island about seventy-five miles from Colombo, the capital, was chosen for initial operations. Roughly, this area is seven by ten miles in extent. Included within its boundaries are twenty-four rubber and tea estates, and from forty to fifty towns, villages, and hamlets. The estate population numbers about 8,000 and averages one person to the acre; the village population is approximately 18,000. The district is mountainous, and large portions of it can be reached only on foot; on one estate, certain of the coolie lines are about five miles apart and difficult of access, as the estate extends over a mountain range.

Both the intensive, and dispensary plans have been followed in the work to date. On the estates, where it is possible to exercise a considerable degree of control over the coolies while they are being examined and treated, and in the villages, the operations have been of the intensive type. In two of the villages, however, Alawatagoda and Wilane, in which operations were

begun during the month of April, many obstacles, most of them of a religious nature, were encountered, and the work finally had to be abandoned before being completed. Examination and treatment by the dispensary method was carried out in the central office at Matale and in the village of Katngastota.

Up to December 31, 1916, operations had been brought to a close on ten estates and in the villages of Alawatagoda and Wilane, while work was in progress on five other estates and in four other villages, as well as in four schools and one college.

#### TREATMENT.

Further experiments as to the value of oil of chenopodium in the treatment of hookworm disease were conducted during the year. The efficacy of this drug was tested under varying conditions of administration, in doses of different sizes, and in certain instances studies were made of its value in comparison with thymol and beta-naphthol. Practically all reports agree that oil of chenopodium is the most effective remedy for expelling *Ascaris*, and that it is more active than thymol in the treatment of infection with *Oxyuris* and *Trichocephalus*. As to its value in the treatment of hookworm infection, however, the reports received have been conflicting in character—the result, perhaps, of differences in the strength and potency of the drug, in the laboratory technique employed, or in the methods of administration.

Alarming symptoms, and sometimes death, have been reported in the Southern States, the West Indian colonies, Panama, Nicaragua, Ceylon, and Egypt following the administration of the drug in accordance with accepted methods of treatment, and in nearly every instance in less than the maximum dose. Extreme caution in the use of the drug is therefore indicated until its proper method of preparation has been learned, its chemical composition and stability standardized, and a safe dosage and method of administration established. The fact that the drug is a powerful poison, often uncertain in action under conditions at present attending its preparation and administration, should lead all medical officers to be extremely discriminating in its use.

In administering the drug in Nicaragua, Dr. Molloy reports that no arbitrary dosage has been followed. The dose recommended by Dr. Schüffner, 1.00 gram to 1.20 grams as the maximum (15 to 18 minims), was followed for a while, but this was found to be insufficient under ordinary conditions. The dose was finally increased to a maximum of 2.00 grams (30 minims). In none but very exceptional cases was a dose of 3.00 grams (recommended by some physicians in the Far East) prescribed in a dispensary. The maximum dose which can be safely prescribed in dispensaries operating in Central America, where the average weight is about 120 pounds, is believed by Dr. Molloy to be 2.00 grams.

As a rule the dose is proportioned according to age, as follows: Two drops for each year of age to the age of 24, 48 drops being considered the maximum. This amount of the ordinary oil of chenopodium, dropped from a dropping bottle, weighs approximately 2.00 grams. This dose is always given in two or three equal parts, with an hourly, or two-hourly, interval between portions (two hours if given in two equal parts, or one hour if given in three equal parts).

The mode of administration followed is essentially as follows: All solid food is prohibited after the midday meal the day before administering the drug. At 4 p. m. of this day, the patient is given a cleansing purge of Epsom salts. By giving this preliminary purge at 4 o'clock, the necessity of having to get up during the night is avoided, since the purgative will have acted, as a rule, before bed-time.

At 6 o'clock the following morning, before any food is eaten, the first portion of sugar containing the chenopodium is taken, followed by the remainder at hourly or two-hourly intervals. Two hours after the last of the chenopodium, a good dose of Epsom salts (usually a little

more than an ounce for adults) is taken to expel the worms. This is repeated, if necessary, in two hours.

During the last quarter of the year, a series of experiments was begun in Nicaragua to determine the efficacy of chenopodium treatment under given conditions and in given doses. These experiments are still under way, and will be continued until a large number of cases have been treated.

Chenopodium oil, alone, is being used as the basis of treatment. Chenopodium oil mixed with a sufficient amount of oil of eucalyptus to disguise its unpleasant taste and odour (three parts chenopodium and one part eucalyptus) and chenopodium in capsules, are also being used. These treatments are being given to the recruits of the Nicaraguan army, are personally administered by a technical assistant, and all examinations are made with the use of the centrifuge.

In Salvador, oil of chenopodium, given usually in capsules, and thymol with equal parts of sugar of milk, also administered in capsules, are the drugs which have been used. In some instances both oil of chenopodium and thymol have been given to the same patients. When chenopodium is taken the preliminary purge is omitted, a dose of Epsom salts being given in the majority of cases following the last dose of chenopodium. No re-examinations are made in less than one week following the last treatment; in most cases, a longer period is allowed. The centrifuge is used, two slides being examined before and two after centrifuging.

In this country, experiments were conducted as to the relative efficiency of three methods of treatment—that is, oil of chenopodium alone, thymol alone, and one dose of oil of chenopodium followed by thymol for the second and for all subsequent treatments. These experiments, however, have not progressed sufficiently to draw positive conclusions. From the investigations so far conducted it would appear that with fifteen drops of oil of chenopodium administered every one or two hours for three doses, followed by castor oil, a larger number of persons are cured with two treatments than when thymol is administered.

In three laboratories operating in Panama, thymol is used; in one, chenopodium. Each drug is reported as having its advantages. At the close of the third quarter, 1916, a change to the exclusive use of chenopodium was being considered, but during the last quarter the results obtained by the laboratory using chenopodium were unsatisfactory. The cause may have been faulty technique on the part of the new microscopists employed in that laboratory, the drug may have been poor in quality, or there may have been some other cause not yet determined.

In administering the drug in Guatemala, a mathematical table of dosage is not adhered to. The minimum dose is 0.65 c.c.; the maximum, 3.00 c.c. To a child below ten years, either the minimum dose is given or the dose is increased according to the physical condition of the child; to an average adult, 2 c.c. is given; and to a strong, vigorous male, the maximum dose. At each treatment the dose is divided into three portions, with one hour intervals. Two hours following the last dose, a purge of sodium sulphate is administered.

During the early months of the work in Ceylon, oil of chenopodium was administered in maximum doses of eight minims, repeated in two hours. Castor oil was the only purgative used at this time. Subsequently, the dose was increased to ten and then to twelve minims, until, upon the recommendation of the Malaya Board and of Colonel W. Perrin Norris, Associate Director for the East, it was increased to a maximum of sixteen minims, repeated hourly for three doses. Towards the end of the year, magnesium sulphate was used almost to the exclusion of castor oil as a purgative. With the 8-minim doses, it was rare that more than 20 to 30 per cent. of cures were secured after two treatments. As the size of the dose was increased better results were obtained, until, among one group

of patients, there were 65.7 per cent. of cures after two treatments.

At the present time, the dispensers in Ceylon are given the following instructions concerning the administration of chenopodium:

1. Oil of chenopodium may be administered in accordance with the following table:

| Age.               | Dose of Chenopodium                    |
|--------------------|--|
| 1 to 2 years ...   | 3 minims hourly for three doses        |
| 3 to 5 years ...   | 4 to 5 minims hourly for three doses   |
| 6 to 10 years ...  | 6 to 9 minims hourly for three doses   |
| 11 to 16 years ... | 10 to 13 minims hourly for three doses |
| 17 to 50 years ... | 14 to 16 minims hourly for three doses |
| Above 50 ...       | 12 to 14 minims hourly for three doses |

In any instance where it is impossible or impracticable to give three doses for a treatment, the maximum dose may be divided into two equal parts, and the second portion be administered at an interval of one or two hours after the first.

2. The drug may be administered on sugar, in milk, or in gelatin capsules or globules.

3. On the evening before the treatment is to be given, a dose of Epsom salts is administered in accordance with the following table:

| Age.               | Dose of Epsom salts solution. |
|--------------------|-------------------------------|
| 1 to 5 years ...   | ... 4 drams of the solution   |
| 6 to 10 years ...  | ... 8 drams of the solution   |
| 11 to 15 years ... | ... 12 drams of the solution  |
| 16 to 20 years ... | ... 16 drams of the solution  |
| 21 and above ...   | ... 24 drams of the solution  |

Five pounds of Epsom salts dissolved in five gallons of hot water makes the above solution.

In case this solution is objectionable to certain persons, castor oil may be given as the purgative, in which case give as follows:

| Age.               | Dose of castor oil. |
|--------------------|---------------------|
| 1 to 3 years ...   | ... 2 drams         |
| 4 to 8 years ...   | ... 3 to 5 drams    |
| 9 to 16 years ...  | ... 6 to 10 drams   |
| Above 16 years ... | ... 8 to 16 drams   |

One and one half ounces is usually the maximum dose that should be given to a female.

4. At, say, 6 o'clock the following morning give the first dose of chenopodium and repeat this dose at 7 and 8 o'clock; at 10 o'clock give a purgative similar in size to, or if the bowels moved thoroughly, smaller than, the one given on the previous evening.

5. Only a light meal should be eaten the evening before treatment, and no food and very little water should be taken on the morning of treatment, until after the bowels have moved well following the second purgative.

6. No alcohol in any form, or acids, should be taken for a period of twelve hours before and after taking oil of chenopodium, as these substances assist in the absorption of the drug into the system, and this is very undesirable. Symptoms of poisoning may follow if this precaution is disregarded.

7. Dispensers on estates should keep their cases under direct observation until after the last dose of the purgative has been given and has acted. Dispensers in the villages should arrange to be notified in case any of their cases become ill after treatment, or if the purgative does not move the bowels thoroughly, in which case it should be repeated.

8. No treatment should be given until a medical officer has examined the person. The dispenser must not treat persons who have developed the following conditions after previous treatment, until after re-examination by a medical officer:

(a) Very old or emaciated persons, who are made weak by, or after, treatment;

(b) Persons suffering from acute diseases, such as malaria, dysentery, rheumatism, etc.;

(c) Children under two years of age, who become ill after treatment;

(d) Pregnant women, who should not be treated in any instance.

9. No re-examination of the excrement should be made until one week has elapsed after the second treatment; such examination should be made one week after each succeeding treatment. Treatments should be repeated every ten days until the case is cured. In case only two doses are given for a treatment, it may be repeated at the end of eight days. The excrement should not be re-examined in less than one week after treatment, for the reason that the drug causes the female worm to stop laying eggs for a number of days, and if examination is made in less than one week, the specimen may be negative when in reality the worms have not all been expelled.

#### FILARIAL PERIODICITY.

THE following are the conclusions arrived at by Dr. Warrington Yorke and Dr. B. Blacklock in an article published in the *Annals of Tropical Medicine* (Vol. XI, No. 2, August, 1917):—

1. Obstruction to the passage of *Microfilaria bancrofti* through the cutaneous vessels occurs at all times of the day and night, but is at a minimum at the end of the period of bodily activity.

2. Although this obstruction aids in the piling up of the larvæ in the cutaneous vessels, it is in no way responsible for the nocturnal periodicity.

3. The nocturnal periodicity is primarily dependent upon periodic variations in the arterial supply of larvæ to the cutaneous vessels.

4. By reversing the hours of sleep and activity, cutaneous immigration becomes diurnal instead of nocturnal. The change, however, takes place gradually;

after the periods of sleep and activity had been reversed for four days the time of maximum concentration of the larvæ in the cutaneous vessels had only been set back six hours (from midnight to 6 A.M.); when reversal of the hours of sleep and activity had lasted for eleven days the time of maximum cutaneous concentration had been changed from midnight to midday.

5. The number of microfilariae, as judged from the maximum concentration in the cutaneous blood, remained at practically a constant level during the period of observation (21st December, 1916—10th February, 1917).

6. The number of microfilariae present in 100 cubic centimetres of urine varied greatly at different times during a 24-hour period. These variations, which were irregular and gave no indication of either a nocturnal or diurnal periodicity, are to be explained on the assumption that the majority of the microfilariae escaped into the urine with the blood. Graphs depicting the number of larvæ per cubic centimetre of urinary blood reveal the existence of a regular periodicity corresponding to that of the larvæ in the cutaneous blood, with the difference that the time of maximum concentration was several hours later.

7. The number of microfilariae in the renal and vesical vessels exhibits a nocturnal periodicity analogous to that in the cutaneous vessels.

#### INSECT-BORNE DISEASES.

AN admirable article summarising our knowledge of insect-borne disease by Mr. M. E. MacGregor, of the Wellcome Bureau of Scientific Research, appeared in the *Journal of Tropical Medicine and Hygiene* (September 15th, 1917). We herewith reproduce the excellent tables given in that article:—

#### I

##### THE MORE IMPORTANT INSECT-BORNE DISEASES OF UNKNOWN ORIGIN.

N.B.—Names between square brackets=certain vectors; names without square brackets=probable vectors; names followed by ? = possible vectors.

| Organism.         | Host.      | Disease.  | Vector.  |
|-------------------|------------|---|--|
| ? ... ..          | Man ... .. | Dengue (breakbone fever) ..   | [Sandflies ( <i>Phlebotomus</i> ), Mosquitoes <i>C. fatigans</i> ; <i>S. fasciata</i> ]. |
| ? ... ..          | " .. ..    | Three-day fever, <i>syns.</i> "Dog disease," Sandfly fever, <i>Phlebotomus</i> fever. | [Sandflies ( <i>Phlebotomus</i> ) Mosquitoes, <i>C. fatigans</i> ; <i>S. fasciata</i> ]. |
| ? ... ..          | " .. ..    | Yellow fever ... ..   | [Mosquitoes ( <i>Stegomyia fasciata</i> )].  |
| ? ... ..          | " .. ..    | Trench fever ... ..   | Lice?  |
| ? Salivary toxin? | " .. ..    | Tick paralysis (American) ...   | [Ticks ( <i>Dermacentor-venustus</i> )].   |
| ? Salivary toxin? | " .. ..    | Tick paralysis (Australian)...  | [Ticks ( <i>Ixodes ricinus</i> )].   |
| ? ... ..          | " .. ..    | Rocky Mountain spotted fever.   | [Ticks ( <i>Dermacentor venustus</i> )].   |
| ? ... ..          | " .. ..    | Japanese river fever (shima mushi).   | [Mites ( <i>Larval trombididae</i> )] "aka mushi."                                       |
| ? ... ..          | " .. ..    | Acute anterior poliomyelitis  | ? Many insects have been claimed as vectors, notably <i>Stomoxys calcitrans</i> ?        |
| ? ... ..          | " .. ..    | Pellagra ... ..   | ? Gnats of the genus <i>Simulium</i> have been claimed?                                  |
| ? ... ..          | " .. ..    | Typhus fever ... ..   | [Lice].  |

## II.

## THE MORE IMPORTANT INSECT-BORNE DISEASES OF BACTERIAL ORIGIN.

N.B.—Names between square brackets=certain vectors; names without square brackets=probable vectors; names followed by ? = possible vectors.

The word "flies" includes in the main: *Musca domestica*, *Fannia* spp., *Calliphora* spp., *Lucilia* spp., and *Sarcophaga* spp.

| Organism.                                    | Host.            | Disease.  | Vector.   |
|--|------------------|---|---|
| <i>Bacillus anthracis</i> ...                | Man and animals  | Anthrax ...   | [Flies], <i>Tabanida</i> ? Beetles?   |
| " <i>dysenteriae</i> ...                     | " ...            | Bacillary dysentery ...   | [Flies] ( <i>Musca domestica</i> , <i>Calliphora</i> spp., <i>Lucilia</i> spp.)                                   |
| " <i>leprae</i> ...                          | " ...            | Leprosy ...   | Flies? Fleas? Bed-bugs? Skin mites? Mosquitoes?   |
| " <i>paratyphosus</i> A ...                  | " ...            | Paratyphoid fever ...   | [Flies].  |
| " " B ...                                    | " ...            | " " ...   | [Flies].  |
| " <i>pestis</i> ...                          | " and rats ...   | Plague ...  | [Flies].  |
| " <i>tuberculosis</i> ...                    | " and animals .. | Tuberculosis ...  | [Flies], cockroaches, fleas? Bed-bugs?  |
| " <i>typhosus</i> ...                        | " ..             | Typhoid fever ...   | [Flies].  |
| <i>Bartonella bacilliformis</i> x-bodies ... | " ...            | Verruga ...   | [ <i>Phlebotomus verrucum</i> ].  |
| <i>Spirillum cholerae</i> ...                | " ...            | Cholera ...   | [Flies], cockroaches, ants. Although the main channel of infection is the consumption of infected food and water. |
| <i>Micrococcus melitensis</i> ...            | " and goats ...  | Undulant fever; <i>syns.</i> Malta fever, Mediterranean fever, Remittent fever. | [Flies]. Although the main channel of infection is the consumption of goat's milk.                                |
| <i>Diplococcus intracellularis</i> ...       | " ...            | Cerebrospinal fever ...   | Flies?  |
| " <i>pemphigi contagiosi</i> ...             | " ...            | Tropical impetigo ...   | [Lice].   |

## III.

## THE MORE IMPORTANT INSECT-BORNE DISEASES OF PROTOZOAL ORIGIN.

N.B.—Names between square brackets=certain vectors; names without square brackets=probable vectors; names followed by ? =possible vectors.

The word "flies" includes in the main:—*Musca domestica*, *Fannia* spp., *Calliphora* spp., *Lucilia* spp., and *Sarcophaga* spp.

| Organism.                              | Host.                      | Disease.                    | Vector.                                |
|--|----------------------------|-----------------------------|--|
| <i>E. histolitica</i> ...              | Man ...                    | Am. dysentery ...           | [Flies].                               |
| <i>Lambia intestinalis</i> ...         | " ...                      | Flagellate ...              | [Flies].                               |
| <i>Plasmod. Malarie</i> ...            | " ...                      | Quartan ...                 | (Anophelines).                         |
| " <i>vival</i> ...                     | " ...                      | Benign tertian ...          | "                                      |
| " <i>falciparum</i> ...                | " ...                      | Malignant tertian ...       | "                                      |
| <i>Leishmania tropica</i> ...          | " ...                      | Oriental sore ...           | Flies? fleas? phlebotomus? hippobosca? |
| " <i>donovani</i> ("L. P. bodies") ... | " ...                      | K. azar ...                 | Bed-bugs! fleas? triatoma?             |
| " <i>sp. incerta</i> ...               | " ...                      | Espundia ...                | ? A blood sucking insect?              |
| " <i>infantum</i> ...                  | Children ...               | Leishmaniasis ...           | Fleas?                                 |
| <i>Trypanosoma gambiense</i> ...       | Man ...                    | Sleeping sickness ...       | (Tsetse flies) ( <i>G. palpalis</i> ). |
| " <i>rhodescence</i> ...               | " ...                      | " ...                       | <i>G. morsitans</i> .                  |
| " <i>brucei</i> ...                    | Cattle and horses ...      | Fly sickness ("Nagana") ... | "                                      |
| " <i>lewisi</i> ...                    | Rats ...                   | Rat trypanosomiasis ...     | ? Louse? fleas?                        |
| " <i>evansi</i> ...                    | Horses, mules, and camels. | Snmra ...                   | Tabanidae (horse flies).               |
| <i>Schistotry panum</i> ...            | Man ...                    | Chaga's disease ...         | Triatoma.                              |
| <i>Babesia bigeminum</i> ...           | Cattle ...                 | Red water fever ...         | Ticks.                                 |
| " <i>ovis</i> ...                      | Sheep ...                  | Piroplasmosis ...           | Ticks.                                 |
| " <i>canis</i> ...                     | Dogs ...                   | Malignant jaundice ...      | Ticks.                                 |
| " <i>caballi</i> ...                   | Horses and mules ...       | Piroplasmosis ...           | Ticks.                                 |
| <i>Nutifalia equi</i> ...              | Man ...                    | Ophthalmia egyptica ...     | Flies.                                 |
| (? <i>Chamydozoa</i> ) ...             | " ...                      | .....                       | ...                                    |

## IV.

## THE MOST IMPORTANT DISEASES OF HELMINTHIC ORIGIN.

Names in square brackets=certain vectors.

| Organism.                         | Host.                      | Disease.                | Vector.                         |
|-----------------------------------|----------------------------|-------------------------|---------------------------------|
| <i>Dipylidium caninum</i> ...     | Man and dogs ...           | Tæniasis (tapeworm) ... | [Doglouse]. Dog and human flea. |
| Ova of certain helminths ...      | Man ...                    | Helminthiasis ...       | [Flies].                        |
| <i>Filaria loa</i> ...            | " ...                      | Calabar swellings ...   | [Horse flies].                  |
| <i>Microfilaria bancrofti</i> ... | " ...                      | Elephantiasis ...       | [Mosquitoes].                   |
| <i>Euaria immitis</i> ...         | Dogs ...                   | Dog filariasis ...      | Mosquitoes.                     |
| <i>Hyemonolepis diminuta</i> ...  | Rats and occasionally man. | Tæniasis ...            | Fleas.                          |



## V.

## THE MORE IMPORTANT INSECT-BORNE DISEASES OF SPIROCHÆTAL ORIGIN.

N.B.—Names between square brackets=certain vectors; names without square brackets=probable vectors; names followed by ?=possible vectors.

The word "flies" includes in the main:—*Musca domestica*, *Fannia* sps., *Calliphora* sps., *Lucilia* sps., and *Sarcophaga* sps.

| Organism.                     | Host.     | Disease.                              | Vector.   |
|-------------------------------|-----------|---------------------------------------|---|
| <i>Spirochæta carteri</i> ... | Man ...   | Indian relapsing fever ...            | [Lice].   |
| " <i>duttoni</i> ...          | " ...     | African relapsing fever (Tick fever.) | [Ticks ( <i>O. moubata</i> , <i>O. savignyi</i> )]. |
| " <i>gallinarum</i> ...       | Fowls ... | Spirochætosis ...                     | [ <i>Argas persicus</i> ].                          |
| " <i>novyi</i> ...            | Man ...   | American relapsing fever ...          | [Lice].   |
| " <i>parlenuis</i> ...        | " ...     | Yaws (Framboesia) ...                 | Flies?  |
| " <i>recurrentis</i> ...      | " ...     | European relapsing fever ...          | [Lice]. Bed-bugs?                                   |
| " <i>berbera</i> ..           | " ...     | North African relapsing fever.        | [Lice].   |

## THE MORE IMPORTANT DISEASES DIRECTLY ATTRIBUTABLE TO INSECTS AND ACARINA.

N.B.—Name between square brackets = certain vector.

|  |                            |  |   |
|--|----------------------------|--|---|
| The larvæ of <i>Fannia canicularis</i> ...           | Man ...                    | Intestinal myiasis ...                   | .....                                     |
| " " <i>Prophila casei</i> ...                        | " ...                      | Ditto ...                                | .....                                     |
| " " <i>Eristalis tenax</i> ...                       | " ...                      | Ditto ...                                | .....                                     |
| " " <i>Muscina stabulans</i> ...                     | " ...                      | Ditto ...                                | .....                                     |
| " " <i>Sarcophaga</i> sps. ...                       | " ...                      | Intestinal, dermal and muscular myiasis. | .....                                     |
| " " <i>Lucilia</i> sps. ...                          | " ...                      | Ditto ditto                              | .....                                     |
| " " <i>Calliphora</i> sps. ...                       | " ...                      | Ditto ditto                              | .....                                     |
| " " <i>Chrysomya macellaria</i> (the screw worm.)    | " and animals              | Nasal, auricular, and dermal myiasis.    | .....                                     |
| " " <i>Cordylobia anthropophaga</i> (the Tumbu fly.) | " ...                      | Dermal myiasis ...                       | .....                                     |
| " " <i>Dermatobia hominis</i> ...                    | " ...                      | Ditto ...                                | .....                                     |
| " " <i>Hypoderma bovis</i> , &c.                     | Cattle (occasionally man.) | Ditto (Creeping disease in man.)         | [Mosquito ( <i>Janthnosoma lutzii</i> )]. |
| " " <i>Oestrus ovis</i> ...                          | Sheep (rarely man.)        | Nasal myiasis ...                        | .....                                     |
| " " <i>Gastrophilus equi</i> , &c.                   | Horses                     | Gastric myiasis ...                      | .....                                     |
| " " <i>Trombididae</i> (Harvest mites.)              | Man ...                    | Severe cutaneous irritation              | .....                                     |
| <i>Pediculoides ventricosus</i> ...                  | " ...                      | Dermatitis ...                           | .....                                     |
| <i>Tyroglyphus stro</i> ...                          | " ...                      | " (the so-called "vanillism").           | .....                                     |
| Other <i>Tyroglyphidae</i> ...                       | " ...                      | " (Grocers' itch) ...                    | .....                                     |
| <i>Tyroglyphus longior castellani</i> ...            | " ...                      | Copra itch                               | .....                                     |
| <i>Sarcoptes scabiei</i> ...                         | " and animals              | " Itch" or "scabies"                     | .....                                     |
| <i>Pediculus capitis</i> ...                         | " ...                      | Pediculosis of the head                  | .....                                     |
| " <i>humanus</i> ...                                 | " ...                      | Ditto body                               | .....                                     |
| <i>Phthirus pubis</i> ...                            | " ...                      | Ditto axillary and pubic regions.        | .....                                     |
| <i>Dermatophilus penetrans</i> (Chiggers.)           | " and animals              | Severe cutaneous irritation...           | .....                                     |

## THE MORE IMPORTANT INSECT-BORNE DISEASES OF FUNGUS ORIGIN.

N.B.—Name between square brackets = certain vector.

|                                   |         |           |                    |
|-----------------------------------|---------|-----------|--------------------|
| <i>Achorion schonleinitii</i> ... | Man ... | Favus ... | [Lice (Pediculi)]. |
|-----------------------------------|---------|-----------|--------------------|

Mr. MacGregor concludes his articles with the following remarks:—

It should be borne in mind that a large number of diseases included in the foregoing tables are not confined to being spread by insects, and insect transmission may, in some cases, only be occasional. This fact, however, cannot afford the preclusion of such diseases from consideration, and where transmission of the indirect type is possible, it is obvious that we are unable to form any just estimate of its relative importance. Probably, nevertheless, the dissemination of pathogenic micro-organisms by flies, for all that has lately been said in this connection, has not even yet been over-emphasized. It seems more than likely that *Bacillus tuberculosis* is spread in this manner from infective sputum to food (milk particularly) to a much greater extent than is commonly imagined, and there being no probability of

rapid acute infection, as with *B. typhosus*, the part played by the fly is too apt to be overlooked.

Much of our knowledge with regard to insects and disease is still indefinite, as may be seen from the tables, but to anyone not particularly conversant with the subject, what we already know with certainty, even in connection with only the more important diseases that have been considered, may be sufficient to cause some little surprise.

## TREATMENT OF PREGNANCY IN CHOLERA CASES.

DR. P. McC. LOWELL, of Manila, has a practical article in *The Philippine Journal of Science* (Vol. XII, July, 1917) on the handling of a pregnant woman in cholera. In recent outbreaks



in Manila, Dr. Lowell has had good results with the hypertonic salt solution with soda bicarbonate, and in 302 non-pregnant cases the mortality was only 19 per cent., whereas in the case of pregnant women in 66 cases there were 30 deaths or 45 per cent. His conclusions as to the best way of handling cases of pregnancy in such serious conditions are given as follows:—

From the facts narrated above, it is evident that the speedy termination of attempted abortion, or the removal of the dead foetus is not only justified but indicated. Even if the number of cases experimented upon may seem to be small, I think it is sufficiently large when considering the results obtained. The almost immediate urination following and the general change in the condition for the better after the delivery were at times nothing short of marvellous.

This method seems to be original, as I am unable to find any mention of it in the literature available, with the possible exception of Davis, who advocates the speedy termination of the labour if it should start, but says nothing about removing the dead foetus when abortion is not threatened.

#### CONCLUSIONS.

1. Pregnant cholera cases have a higher mortality than non-pregnant cases, if left to their own resources.
2. The later the pregnancy the graver is the prognosis for the mother.
3. There is some factor other than mechanical which kills the foetus very early in the disease in the majority of the cases.
4. Abortions occur in most of the cases, and the older the foetus the greater is the tendency to abort.
5. Most of the pregnancies come to a fatal termination.
6. Abortion is nature's therapeutic measure in aiding the mother in her fight for life.
7. The essential factor in the treatment of pregnant cholera cases is to remove the dead foetus as soon as possible and in the manner best suited to the mother's condition, because it shortens the periods of convalescence, preserves the strength of the mother, and reduces the mortality to about that of the non-pregnant cases.

THE second issue of "Recalled to Life" (J. Bale Sons and Danielson Ltd.) continues to give valuable account of recent developments in the case of the care, re-education and return to civil life of the disabled, and institutions for discharged soldiers and sailors are being founded. Sir Walter Lawrence gives an interesting account of orthopædic work, at the present moment there are in use some 10,000 beds for orthopædic cases, and Sir Wm. Osler described the work done and showed how little the capabilities of the maimed are appreciated.

AN excellent article on Amœbic Abscess of the Liver by Dr. Rufino Abriol appears in *The Philippine Journal of Science*, May, 1917.

*Ophthalmology* (Seattle U. S. A., July, 1917) contained a long and useful synopsis of legislation by the State for the Blind.

THE *Proceedings* of the Kathiawar Medical Society (for September, 1917) contain a useful article on uric acid gravel and stone by Dr. N. T. Mehta, of Junagadh, and we are glad to see, as in all places where stone is common, a preference for the crushing operation.

Sub-Assistant Surgeon R. K. Desai gives a case of "appendicitis" and quotes at full length a lot of very ordinary and harmless prescriptions, after which the patient recovered. It is far from certain that the diagnosis was correct, at least the paper as printed gives no reason to suppose so.

Sub-Assistant Surgeon M. J. Adalfa has a useful note on two cases of eclampsia. It is satisfactory to see that the Kathiawar Medical Society continues to do useful work.

#### Reviews.

**The British Journal of Surgery, Vol. V, No. 17, Issued Quarterly.**—Bristol, John Wright & Sons, Ltd. Subscription 3ls. 6d. per ann. Single Numbers 8s. 6d. net.

THE present number of this excellent journal is, as usual, mainly composed of articles dealing with military surgery. Captains Gamlen and S. Smith's study of the inter-relation between the radiography and surgery of gunshot wounds of the head is too technical for the average surgeon, but should be of interest to the radiographer. Mr. H. L. W. Woodroffe deals concisely and clearly with the technique of the repair of cranial defects by means of cartilaginous grafts, and records seven cases so treated with encouraging results. Captains Max Page and Le Mesurier, R.A.M.C., contribute a long article on the early treatment of gunshot fractures of the thigh with an analysis of 125 cases; Thomas' or Hodgens' splints gave satisfactory results in all cases. The details of reduction of the fracture and application of the splint are carefully described and illustrated. A short article by Col. G. Barling, A.M.S., deals with the technique of the Carrel treatment of wounds.

Major V. H. Kazanjian and Capt. Burrows deal at length with the treatment of secondary hæmorrhage in fractures of the jaws, discussing the indications for the ligature of different arteries in these formidable cases. The article on oral and plastic surgery by Major Valadier and Capt. Whale, is a valuable contribution, though we should have preferred more details as to the exact methods employed in each of the cases illustrated, by which the remarkably good results shown in the photographs were attained.

**Diagnostic Symptoms in Nervous Diseases.**—By EDWARD L. HUNT. W. B. Saunders Company, 1917.

THE Second Edition of this little book contains new chapters on Cerebro-spinal Fluid, Spinal Localisation and Vertigo. Some new illustrations have also been added. The author adopts the method of taking up important signs and symptoms such as tremors, gaits, paralysis, reflexes, etc., one by one, and showing, in the first place, in what diseases they occur, and then how they differ in these diseases. Lists of conditions in which the symptoms occur are appended to each chapter. Throughout the whole book there is a tendency to over classification, and long lists of diseases, reflexes, gaits, etc., make the book somewhat heavy to read. The chapters on Cerebro-spinal Fluid and Gaits are good and contain much helpful information. The chapter on Electrical Reactions is very short and it seems strange that so highly important a diagnostic method as Electro-diagnosis should receive such scant notice. Only the old and inefficient method of examination by polar. changes is mentioned and no reference is made to Lewis Jones' Condenser which has proved to be much more accurate and efficient, and far less painful than the older methods.

**The Treatment of Emergencies.**—By HUBLEY R. OWEN, M.D. W. B. Saunders Company, 1917.

THE study of First Aid has an unusual importance at the present time and the appearance of this little volume is opportune. It is designed to meet the requirements of those who wish to go into the subject a little more deeply than is usually done. The book is lucidly and interestingly written. The chapter on Bandaging is excellent and the illustrations are the best we have seen in a work of this kind. The teaching is sound, although we cannot agree that patients suffering from opium poisoning should be kept awake by walking them about, as this procedure undoubtedly produces exhaustion and hastens an unfavourable termination. However, the book ably fulfils its object and we have nothing but praise for it. It is well printed and attractively bound.

**The Atreya School of Medicine.**—Calcutta. By P. S. GUPTA, 44 Beadon Street, 1917. KAVIRAJ BIRAJA CHARAN GUPTA, KAVIBHUSHANA, has sent us a learned treatise on the principal works of the "Atreya School of Medicine and their Chronology." It is an attempt to ascertain the Chronology of the more prominent text-writers and commentators of the Ayurveda.

WE learn that there existed two orders or Schools of Hindu medicine—(1) the *Atreya* or what we may call physicians, and (2) the *Dhanwantari* or Surgeons. *Atreya* was the son of *Atri*, and his followers are called the '*Atreya School*.' It is this *Atreya* who is the speaker in the quaint

collection the *Charaka Samhita*, a book about the compilation of which there is much doubt, and its date is far from certain. It is certainly an old book. The little book will no doubt be of interest and use to those who have studied the history of the old Indian medical literature.

**Insanity in every day practice.**—By Dr. E. G. YOUNGER, 4th Ed. Cr. 8vo., London, Baillière, Tindall, & Cox. Price 5s. net.

WE have already noticed the earlier edition of this most useful little book, which sketches for the use of her non-specialist the broad outlines of the subject of insanity. It is divided into three parts; the first deals with definitions of insanity causes, hallucinations, illusions, delusions, premonitory symptoms, and a useful section is devoted to examination of patients, and certification, and its legal bearings.

The next part deals with the types of insanity, mania, melancholia, delusional insanity (paranoia), G. P. I., dementia, and idiocy, imbecility and cretinism; and next are described special forms of insanity such as puerperal, epileptic, alcoholic, post-operative, plumbic, "circular," influenzal, and moral insanity and the borderline states. A useful note on neurasthenia is added, and a brief note on Freudism or psycho-analysis—which is "not likely (says Dr. Younger) to be of assistance in such cases of insanity as are likely to be met with in general practice."

We can again strongly recommend this little book.

**Pharmaceutical Latin.**—By HUGH C. MULDOON, Ph.G., London, Chapman and Hall, Ltd., 1916. Price 6s.

THIS useful book is written by Mr. H. C. Muldoon, of the Massachusetts College of Pharmacy in Boston, and is published in America by Messrs. John Wiley and Sons, New York.

In these days, when classics are not sufficiently taught in the schools, it is not uncommon to meet with eminent physicians and surgeons who are quite unable to explain the meaning of the simplest Latin sentence.

The book is a Latin grammar, reduced to its simplest elements, exceptions to general rules are omitted, the "third" declension is made easy. The examples are useful, and all have a prescription writing bearing, e.g., translate "*Belladonnae radix, mitte capsulas olei santali.*"

We can confidently recommend the book, the appendices and vocabulary are most useful. Professional Latin contains hybrids and words of new origin "that would make Quintilian gasp and stare;" much of it is of 'canine' origin, but the educated physician or surgeon should either avoid its use or use it correctly, and we know of no book better than the present one for teaching these elements,

**Analytical Psychology.**—Collected papers by C. G. JUNG, M.D. Translated by Dr. CONSTANCE E. LONG. Second Edition. London: Baillière, Tindall, and Cox, 1917. Price 15s. net.

THIS collection of papers will be of much interest to those who studied the recent development of psycho-analysis. It is known that the Zurich School, headed by Dr. Jung, is by no means in accord with the crude and, in many respects, disagreeable work of Freud and his followers of the so-called Vienna School.

The Zurich School agrees with Freud in regarding neuroses to be the result of repression, but differ from his view as to the origin of repression. Freud finds this to be in pure sexuality, Jung rather thinks it lies in "man's natural tendency to adapt to the demands of life one-sidedly, according to his type of mentality." The second edition contains several additions. It appears that, as is usual among the Huns, they will see no good in anything that has not been discovered or developed in their own disgraced land; and consequently the writing of the distinguished Zurich professor have been more appreciated in England and America than in Germany. The book consists of 475 pages, divided into XV Chapters, and deals with the psychology and pathology of so-called occult phenomena, with "spiritualistic mediums," and the development of somnambulistic personalities, automatism, hysterical attacks "and the unconscious additional creative work;" in fact with all the recently much discussed phenomena of the modern witchcraft.

Chapter II deals with the association method, the psychic life of the child, the significance of the father in the destiny of the individual. Later chapters discuss the natural and strong prejudice aroused by Freud's conception of the importance of the sexual moment, and on psycho-analysis. Chapter XIII deals especially with the psychology of dreams, and with the psychological *versus* physical origin of mental disease.

The whole book will be read with interest, and Dr. Constance Long has done a useful work in making the recent work of the Zurich professor available to English readers.

**The Practitioner's Pocket Pharmacology.**  
By Dr. L. FREYBURGER, London: Wm. Heinemann, 1917. Price 12s. 6d.

THIS is a useful and compact little work, giving in small compass a complete description of the use and action of all drugs and preparations of the pharmacopœias of Great Britain and America and of some foreign countries. Many "pharmacological disappointments" have wisely been omitted, and so whole subject-matter is arranged alphabetically.

The dosage is given in the English as well as in the metric system.

The book is elegantly bound and well printed and must prove of very considerable use to the busy practitioner.

## Correspondence.

### RECURRENT DISLOCATION OF SHOULDER.

To the Editor of "INDIAN MEDICAL GAZETTE."

SIR,—I was interested to read Captain W. H. Riddell's note in the November number on his apparatus for the protection of recurrent dislocation of the shoulder during games, being myself the unfortunate possessor of a "jack-in-the-box" humerus.

In 1909, I devised a similar apparatus for myself which I wore at intervals for several years. I have worn it to play fives, at boxing and cricket, but to no avail except in the last game in which it prevents over reaching.

I am doubtful whether such or any apparatus really protects to any great extent.

A dislocation of the humerus is brought about in two ways.

I. Raising of the arm which brings the head of the humerus to rest on the already weakened capsule or over the actual existing rent in the capsule. Any slight muscular contraction or impact in this position will now dislocate the head of the humerus from the capsule.

II. A fall on the outstretched arm. This causes a rotation of the head forwards and inwards and the impact continuing, forces the head through the weakest part of the capsule.

In preventing No. I the apparatus is useful but cannot prevent No. II which is the variety of accident most likely to occur in horse riding.

I would be interested to read of any practical evidence of Captain Riddell's apparatus. My own apparatus was a broad piece of webbing four inches wide strapping round the chest and kept in position under the axilla by a pair of narrow braces passing over the shoulders.

A similar armlet of webbing was worn round the upper arm and a swivel hook on a strap attached to the chest piece and hooked into a ring on the armlet fixed the arm to the side.

The strap was of such a length as to prevent the arm being raised over 60 degrees as well as permitting an almost forward reach.

I wore the apparatus directly over the vest and under the shirt.

It was made for me by Messrs. Down Bros. for less than ten shillings.

I believe it to possess the following advantages:—

- (1) Webbing is cheap, durable, and washable.
- (2) A broad band round the arm and chest is more comfortable to wear than a narrow one.
- (3) Two shoulder straps are preferable to one.
- (4) By making a narrow slit in the seam of the shirt, coat, and sleeve for the hook to pass the apparatus can be worn under the shirt and coat.
- (5) The whole apparatus is light and comfortable to wear and from an æsthetic point is practically invisible.

My advice to the wretched sufferer is that no apparatus is a complete safeguard. He should concentrate his attention on his shoulder during those games which his experience permits him to indulge in as nothing short of suturing or tightening the capsule will afford him immunity.

I hope I do not encroach upon your space, but if you should consider this letter to be of interest to readers I trust it will find a column in your pages.

Yours, etc.,  
PRISONERS OF WAR CAMP, } PHILIP SAVAGE;  
NOWGONG, C. I. } CAPTAIN, I.M.S.  
18th November, 1917.

### CASE OF CEREBRO-SPINAL FEVER.

Sapper S-61 Pioneers—Cerebro-Spinal Meningitis.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The following case might prove interesting, as the man in question to my knowledge appears to have been the only Indian who has contracted the disease; furthermore, his having recovered from the disease which has had a pretty high mortality among the natives in East Africa, has led me to submit his case for favour of publication. (Another case since reported.)

By filing these Supplements, which will be issued at intervals, Medical men will be able to make up a complete up-to-date catalogue of professional literature.

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- Ash.** Mind and Health. Rs. 2-3. 1910.  
**Atkinson.** Suggestion and Auto-Suggestion. Rs. 2-8. 1915.  
**Bain.** Mind and Body. The Theories of Their Relation. Rs. 5. 1910.  
**Berkley.** Treatise on Mental Diseases. Rs. 15-12. 1901.  
**Binet.** The Mind and the Brain (L. S. S.). Rs. 5. 1907.  
**Bridger.** Minds in Distress. Re. 1-14. 1913.  
**Brower and Bannister.** Practical Manual of Insanity. Rs. 9-12. 1902.  
**Brown.** Treatment of Nervous Disease. Rs. 11-4. 1905.  
**Bryson.** The Indian Lunacy Manual for Medical Officers and the General Public. A Summary of the Lunacy Acts and Rules regulating the admission into, detention in, and discharge from Government Lunatic Asylums of Private and Public Patients. Compiled by Major R. BRYSON, F.R.C.S.E., Indian Medical Service. Revised by Captain P. HEFFERNAN, I.M.S. Re. 1-8. 1913.  
**Carpenter.** Mental Physiology. Rs. 9. 1896.  
**Clouston.** Hygiene of the Mind. Fifth Edition. Rs. 6-9. 1909.  
**Cole.** Mental Diseases. Rs. 7-14. 1914.  
**Craig.** Psychological Medicine: A Manual of Mental Diseases. Third Edition. Rs. 11-4. 1917.  
**Ebbard.** Mental Depression: Its Cause and Treatment. Rs. 2-8. 1906.  
**Ewens.** Insanity in India: Its Symptoms and Diagnosis with reference to the relation of Crime and Insanity. By G. F. W. EWENS, M.D., Dip. Pub. Health, Major, Indian Medical Service, Superintendent, Punjab Lunatic Asylum, Lahore. Rs. 5. 1908.  
 "The whole field of insanity in India, its causes, varieties, aspects, symptoms and consequences are reviewed and classified with masterly system."—*Pioneer*.  
 "It is impossible to indicate even briefly the interesting varieties of his subject of which Major Ewens treats so ably. No aspect is neglected."—*Statesman*.  
**Forel.** Hygiene of Nerves and Mind in Health and Disease. Rs. 4-8. 1907.  
**Hallam.** The Key to Perfect Health and the Successful Application of Psycho-Therapeutics. Rs. 4. 1912.  
**Hart.** The Psychology of Insanity. As. 14. 1912.  
**Harte.** The New Psychology. Rs. 5. 1903.  
**Hoffman.** Psychology and Common Life. Rs. 3-12. 1903.  
**Hollander.** The Mental Symptoms of Brain Disease. An Aid to the Surgical Treatment of Insanity: Rs. 4-8. 1910.  
 —. The First Signs of Insanity, Their Prevention and Treatment. Rs. 9-3. 1912.  
**Hudson.** The Law of Mental Medicine. Rs. 6-9. 1903.  
**Jones.** Text-book of Mental and Sick Nursing. Rs. 2-4. 1907.  
**Kaplan.** Serology of Nervous and Mental Diseases. Rs. 11-4. 1914.  
**Loeb.** Comparative Physiology of the Brain and Comparative Psychology. Rs. 5-4. 1905.  
**Maudsley.** Responsibility in Mental Disease. Rs. 3-12. 1892.  
**Mercier.** A Text-book of Insanity and other Mental Diseases. Rs. 5-10. 1914.  
 —. Psychology: Normal and Morbid. Rs. 11-10. 1901.  
**Mitchell.** Dreaming, Laughing, and Blushing. Rs. 4-6. 1905.

- Overbeck-Wright.** Mental Derangements in India. Their Symptoms and Treatment: Being a handbook to the Theory and Practice of Mental Disease in India. Together with Notes dealing with the legal aspect of Insanity and the various questions likely to arise concerning it. By Capt. A. W. OVERBECK-WRIGHT, M.B., D.P.H., I.M.S. Rs. 6. 1913.  
 "It is concise, clear, well balanced, and arranged, and gives an exhaustive and useful view of the varieties, symptoms, and management of the various forms of alienation, and a good account of recent researches and doctrines relative to causation and pathology. It fulfils ably the objects for which it was compiled, and is well adapted to be a guide and an aid in the disposal and treatment of lunatics in India."—*B. M. Journal*.  
**Ribot.** Diseases of Memory. Rs. 3-12. 1906.  
**Saleeby.** Worry the Disease of the Age. Rs. 4-8.  
**Shaw.** Essentials of Nervous Diseases and Insanity. Rs. 3. 1904.  
 —. Golden Rules of Psychiatry. As. 12. 1907.  
**Stocker.** Sub-Consciousness. Rs. 3-8. 1906.  
**Stoddart.** The Mind and its Disorders. Rs. 9-6. 1912.  
**Taylor.** Applied Psychology, or Faculties of the Mind. Rs. 5. 1912.  
**Tredgold.** Mental Deficiency. Rs. 7-14. 1908.  
**Williams.** Increasing your Mental Efficiency. Rs. 4-8. 1914.  
**Winslow.** The Insanity of Passion and Crime. Rs. 7-14. 1913.  
**Wood.** Ideal Suggestion: Through Mental Photography. Rs. 5-8. 1893.  
**Younger.** Insanity in Everyday Practice. Fourth Edition. Rs. 3-6. 1917.

### Nervous Diseases.

- Anderson.** Syphilitic Affection of the Nervous System. Rs. 3-12. 1889.  
**Ash.** Nerves and the Nervous. Rs. 2-10. 1911.  
**Bailey.** Diseases of the Nervous System resulting from Accident and Injury. Rs. 15-12. 1906.  
**Ballet.** Neurasthenia. Rs. 4-8. 1911.  
**Beng.** A Text-book of Nervous Diseases. Rs. 19-12.  
**Brown.** The Treatment of Nervous Diseases. Rs. 11-4. 1905.  
**Call.** Nerves and Common Sense. Rs. 2-5.  
**Chase.** General Paresis, Practical and Clinical. Rs. 7. 1902.  
**Dubois.** The Psychic Treatment of Nervous Disorders. Rs. 4-8. 1908.  
**Ebbard.** How to acquire and strengthen Will Power. Modern Psycho-Therapy. A Specific Remedy for Neurasthenia and Nervous Diseases. Rs. 4-14. 1907.  
**Ebbard and Vogt.** How to Restore Life giving Energy to Sufferers from Sexual Neurasthenia and Kindred Brain and Nerve Disorders. Rs. 3-12. 1903.  
**Forel.** Hygiene of Nerves and Mind in Health and Disease. Rs. 4-8. 1907.  
**Gordon.** Diseases of the Nervous System. Rs. 9-6. 1908.  
**Gowers.** Manual of Diseases of the Nervous System. Vol. I Spinal Cord and Nerves. Rs. 11-4. Offered at Rs. 5-10. 1899.  
**Guthrie.** Functional Nervous Disorders in Childhood. Rs. 5-10. 1909.  
**Hedley.** Practical Muscle Testing and the Treatment of Muscular Atrophies. Rs. 2-10. 1897.  
**Herrick.** An Introduction to Neurology. Rs. 5-10. 1916.  
**Hollander.** Nervous Disorders of Men. Rs. 2-10. 1916.  
**Jakob.** Atlas and Epitome of the Nervous System and its Diseases. Rs. 11-4. 1901.  
**Lickley.** The Nervous System. An Elementary Hand-book of the Anatomy and Physiology. Rs. 4-8. 1912.

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- Pearce.** Diseases of the Nervous System. Rs. 10-8. 1906.  
**Poore.** Nervous Affections of the Hand and Other Studies. Rs. 5 10. 1897.  
**Purves and Evans.** Nerve Injuries and Their Treatment. Rs. 6 6.  
**Saleeby.** Worry. The Disease of the Age. Rs. 4-8. 1907.  
**Savill.** Lectures on Hysteria and Allied Vaso-Motor Conditions. Rs. 5-10. 1909.  
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 ———. Nerves in Order. Rs. 2-10. 1905.  
 ———. Nerves in Disorder. Rs. 2-10. 1905.  
**Shaw.** Essentials of Nervous Diseases. Rs. 4. 1904.  
**Srivastava.** The Cure of Nervous and Mental Diseases by Means of Count Mattei's Remedies or Electro-Homoeopathy (I). Price  
**Starr.** Organic and Functional Nervous Diseases. Rs. 18-12. 1913.  
**Stewart and Evans.** Nerve Injuries and Their Treatment. Rs. 6-6. 1916.  
**Taylor.** Paralysis and Other Diseases of the Nervous System in Childhood and Early Life. Rs. 9-6. 1905.  
**Thomson.** Diseases of the Nervous System. Rs. 7-14. 1915.  
**Turner and Stewart.** A Text-book of Nervous Diseases. Illustrated. Rs. 15-12. 1910.  
 ———. Epilepsy. A Study of the Idiopathic Disease. Rs. 7-8. 1907.

**Nursing.**

- Anderson.** Hints to Dressers. By Major S. ANDERSON, M.B., I.M.S. (Reprinting).  
 "A most useful little book, all the more useful, because it is little. There is no verbiage; everything is concise, direct straight-to-the-point. It is just the book which many of us have been waiting for, to put into the hands and heads of our compounders, and other medical assistants"—*Medical Missions in India*.  
**Berkeley.** Gynaecology for Nurses and Gynaecological Nursing. Re. 1-14. 1913.  
 ———. Handbook for Midwives and Maternity Nurses. Rs. 3-12. 1906.  
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 ———. The Indian Catechism of Home Nursing. As. 12. 1917.  
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**Bundy.** Text-book of Anatomy for Nurses. Rs. 6-6. 1915.  
**Caldar.** Lectures on Midwifery for Midwives. Rs. 3-12. 1902.  
 ———. Questions and Answers on Midwifery for Midwives. Re. 1-2. 1915.  
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 "An admirable little book eminently practical and useful, and we can confidently recommend this little pamphlet to all Civil Surgeons in India."—*The Indian Medical Gazette*.  
**Clarke.** A. B. C. of Nursing in Accidents and Illness. As. 12.  
**Cook.** Index of Practical Nursing. Re. 1-8. 1912.  
**Cosgrave and Collie.** Hints and Helps for Home Nursing and Hygiene. As. 12.  
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**Dock.** Materia Medica for Nurses. Rs. 5-10. 1916.  
**Drinkwater.** Sick Nursing (Temple Primer) As. 12. 1907.  
 ———. Essentials of Fever Nursing (Pocket Guide series.) As. 12.  
**Drummond.** Golden Rules of Sick Nursing. As. 12.  
 ———. Physiology for Nurses. Re. 1-14.  
**Duncan.** A Guide to Sick Nursing in the Tropics. Re. 1-14. 1900.

- Forsyth.** Lectures on Medical Diseases for Nurses. Rs. 2-10. 1914.  
**Giles.** Gynaecological Nursing. Rs. 2-10. 1912.  
**Goldie.** Notes on Home Nursing. Re. 1-2. 1907.  
**Goodnow.** First Year Nursing. Rs. 5-11. 1912.  
**Green-Armytage.** Labour-Room Clinics: Being Aids to Midwifery Practice. By Captain V. B. GREEN-ARMYTAGE, M.D., I.M.S., Resident Surgeon, Eden Hospital, Calcutta (Interleaved). Re. 1. 1913.  
 "In every respect it is a useful students' book and can be strongly recommended."—*Indian Medical Gazette*.  
**Groves.** Text-book for Nurses. Anatomy, Physiology, Surgery and Medicine. Rs. 9-6. 1912.  
**Hadley.** General Medical and Surgical Nursing. Rs. 3-0. 1907.  
**Handbook of Nursing,** 1905. For Hospital and General Use. Published under the Direction of the Connecticut Training School for Nurses. Rs. 3-12.  
**Harris.** Lectures on Medical Electricity for Nurses. Re. 1-14. 1913.  
**Hassard.** Practical Nursing for Male Nurses in the R.A.M.C. and Other Forces. Rs. 2-10. 1910.  
**Haultain.** Handbook of Obstetric Nursing. Rs. 3-12. 1908.  
**Herschell and Weiss.** Elementary Clinical Pathology for Nurses. As. 12. 1913.  
**Hewer.** "Our Baby," for Mothers and Nurses. Re. 1-8.  
**Hill.** Nursing Handbook for Soldiers in India. As. 12. 1917.  
**Hosking.** Bandaging Made Easy. As. 12.  
**Humphrey.** A Manual of Nursing, Medical and Surgical. Rs. 2-10. 1911.  
**Jellet.** A Short Practice of Midwifery for Nurses. Rs. 5-10. 1914.  
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**Maitland.** Essentials of Fever Nursing. As. 12. 1913.  
**Marks.** The Maternity Nurses' Daily Guide. Re. 1-2. 1910.  
**Matilda (Sister)** Home Nursing. As. 8.  
**Maxwell and Pope.** Practical Nursing. A Text-book for Nurses. Rs. 5-10.  
**Miles.** Surgical Ward Work and Nursing. Rs. 3-12. 1911.  
**Mills.** Practical Lessons in Nursing. The Nervous and the Insane. Rs. 3-15. 1905.  
**Morten.** (Honor.) The Midwives' Pocket-Book. As. 12. 1902.  
 ———. The Nurses' Dictionary of Medical Terms. Re. 1-8. 1915.  
**Mortimer.** Home Nursing of Sick Children. As. 12. 1899.  
**Neuman.** Home Nursing. Re. 1-2. 1886.  
**Norton.** Clinical Notes for Probationers. As. 12. 1916.  
**Nurses' Guide to Prescription Reading.** Re. 1-2. 1910.  
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**Oxford.** A Handbook of Nursing. Rs. 2-10. 1912.  
**Pocket Case-Book,** for District and Private Nurses. As. 12. 1914.  
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**Stephenson.** Ophthalmic Nursing. Rs. 2-10. 1912.  
**Stewart and Cuff.** Practical Nursing. Rs. 3-12. 1915.



**Nursing—(Concl'd.)**

**Suhrawardy.** Manual of Post-Operative Treatment, A. By HASSAN SUHRAWARDY, Tutor of Surgery, Campbell Medical School, late Senior House Surgeon, Medical College Hospital, Calcutta. Second Edition. Re. 1-8. 1912.

"The great point about this little volume is that it is thoroughly practical, and that it gives a lot of information on the care and treatment of patients after they have left the surgeon's hands. Students beginning to attend the wards will find much of great service to them laid down in a clear and lucid manner; much that they will find invaluable in after-life in the care of their patients."—*Indian Medical Gazette.*

**Upcott.** Antiseptic Methods for Surgical Nurses and Dressers. Re. 1-14. 1907.

**Watson.** A Handbook for Nurses. Rs. 3-12. 1912.

**Wilcox.** Manual of Fever Nursing. Rs. 3-6. 1907.

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**Wood.** Handbook of Nursing for the Home and the Hospital. Re. 1-12.

**Yapp.** Modern Medical and Surgical Nursing for Probationers. Re. 1-14. 1915.

**Obstetrics.**

**Ashton.** Essentials of Obstetrics. Rs. 4-8. 1915

**Ballantyne.** Essentials of Obstetrics. Rs. 3-8. 1904.

**Bandler.** The Expectant Mother. Rs. 4-8. 1916.

**Barbour.** Atlas of the Anatomy of Labour, Exhibited in Frozen Sections. Rs. 2-8

**Barnes.** Manual of Midwifery for Midwives. Rs. 4-8. 1902.

**Bennett.** Lectures to Practising Midwives. Rs. 3. 1909.

**Berkely and Bonney.** The Difficulties and Emergencies of Obstetric Practice. Rs. 18. 1915.

Handbook for Midwives and Maternity Nurses. Rs. 3-12. 1912

**Berkeley.** Gynaecology for Nurses and Gynaecological Nursing. Re. 1-14. 1912.

**Birdwood.** Practical Midwifery for Students, Nurses, and Practitioners (I). Rs. 2-8. 1916.

..... The book gives valuable notes of a practical nature on important subjects of Midwifery. To mention only a few—What to do in the first stage of Labour, how to conduct the second stage of labour and how to conduct the third stage, how to do Craniotomy, Pubiotomy, etc. .... very useful for students and Practitioners.—*Indian Medical Gazette.*

**Blacker.** A Clinical Manual of the Malformations and Congenital Diseases of the Fœtus. Rs. 13-2. 1912.

**Bourne.** Synopsis of Midwifery. Rs. 3-12. 1913.

**Calder.** Questions and Answers on Midwifery for Midwives. Re. 1-2. 1906.

..... Lectures on Midwifery for Junior Students and Midwives. Rs. 3-12. 1912.

**Calwell and Campbell.** Text-book of Treatment: Obstetrics and Gynaecology. Rs. 5-10. 1907.

**Davis.** Obstetric and Gynaecological Nursing. Rs. 6. 1913.

..... Manual of Obstetrics. Rs. 7-14. 1914.

..... Operative Obstetrics, Including the Surgery of the Newborn. Rs. 26-4. 1912.

**Das.** Handbook of Obstetrics. Rs. 10. 1914.

**DeLee.** Obstetrics for Nurses. Rs. 9. 1916.

..... Principles and Practice of Obstetrics. Rs. 26-4. 1915.

**Donald.** An Introduction to Midwifery, for Students and Midwives. Rs. 3-12. 1915.

**Dorland.** Modern Obstetrics. General and Operative. Rs. 12-12. 1901.

**Drake.** Maternity without Suffering. Rs. 2. 1901.

**Dudley.** Principles and Practice of Gynaecology. Rs. 18-12. 1913.

**Eden.** Manual of Midwifery. Rs. 13-8. 1915.

**Edgar.** The Practice of Obstetrics for the Student and the Practitioner. Rs. 22-8. 1913.

**Falconer.** A Manual for the Use of Pupil, Midwives and Students (I). Rs. 2. 1902.

**Fothergill.** Manual of Midwifery. Rs. 7-14. 1907.

..... A Course of Lectures to Midwives and Maternity Nurses. Rs. 3-6. 1907.

..... Golden Rules of Obstetric Practice. As. 12. 1910.

**Galabin and Blacker.** The Practice of Midwifery. Rs. 13-8. 1910.

**Glover.** Midwifery Notes for the Use of Students. Re. 1-4. 1910.

**Green-Armytage.** Labour-Room Clinics: Being Aids to Midwifery Practice. By Captain V. B. GREEN-ARMYTAGE, M.D., I.M.S., Resident Surgeon, Eden Hospital, Calcutta. Re. 1-8. 1912.

"In every respect it is a useful student's book and can be strongly recommended."—*Indian Medical Gazette.*

**Greenwood.** Twilight Sleep, the Painless Method of Childbirth. Re. 1.

**Haultain.** A Practical Handbook of Midwifery. (3rd Edn.) Rs. 4-8. 1912.

**Herman.** First Lines in Midwifery. Rs. 3-12. 1907.

..... Difficult Labour. Rs. 9-6. 1912.

**Herman and Maxwell.** Diseases of Women. A Clinical Guide to Their Diagnosis and Treatment. Rs. 18-12. 1913.

**Hirst.** Text-book of Obstetrics, with 653 Illustrations. Rs. 15-12. 1912.

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..... Delayed and Complicated Labour. Rs. 5-10. 1911.

..... Practical Text-book of Midwifery for Nurses. Rs. 3-12. 1916.

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..... A Short Practice of Midwifery. Rs. 9-6. 1913.

..... A Short Practice of Midwifery for Nurses. Rs. 5-10. 1914.

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**Kerr.** Operative Midwifery, with 308 Illustrations in the text. Rs. 18-12. 1916.

**King.** A Manual of Obstetrics. Rs. 9-6. 1904.

**Longridge.** A Manual for Midwives. Rs. 2-10. 1908.

**Lukis.** An Elementary Manual of Midwifery for the Use of Indian Midwives. (2nd Edn.) Re. 1. 1915.

**Morten.** The Midwives' Pocket Book. As. 12.

**Nail.** Aids to Obstetrics. Re. 1-8. 1916.

**Newman.** Manual of Aseptic Surgery and Obstetrics. By Major E. A. R. NEWMAN, I.M.S., 2nd Edition, Revised, with Additional Illustrations. Rs. 3-8. 1908.

..... In this second edition, a very valuable Chapter has been added dealing with asepsis in obstetric practice.

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**Norton.** The Midwife's Companion. As. 12.

**Playfair.** The Science and Practice of Midwifery. Ninth Edition. 2 Vols. Rs. 21. 1898.

**Rion.** Painless Child-birth in Twilight Sleep. As. 12. 1915.

..... Golden Motherhood, Twilight [Sleep from the Popular Point of View. Illustrated. Re. 1.

**Robinson.** The Midwife's Pronouncing Dictionary of Obstetrical and Gynaecological Terms. As. 12. 1909.

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**Tweedy and Wrench.** Practical Obstetrics. Illustrated. Rs. 9-6. 1914.

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**Wrench.** Rotunda Midwifery for Nurses and Midwives. Rs. 4-8. 1908.



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It is most important that the reader should study Appendix III, p. 704, containing various official regulations that have been made owing to the War. In this Edition several additions have been made in order to bring the book up-to-date, and like the fifteenth published a year ago this edition is throughout adapted to the new edition of the British Pharmacopœia published December 31, 1914.

THACKER, SPINK & Co., Medical Booksellers and Publishers, P. O. Box 54, Calcutta.

The patient was altogether 47 days in Hospital, and was then evacuated to the Base to be invalided. He received altogether 60 grains of Soamin intermuscularly in three-grain doses, thus:—

|                                 |     |     |   |
|---------------------------------|-----|-----|---|
| First week, daily ...           | ... | ... | 7 |
| Second week, alternate days ... | ... | ... | 3 |
| Third week, daily ...           | ... | ... | 7 |
| Fourth week, alternate days ... | ... | ... | 3 |

On admission the case certainly looked to be one of cerebral malaria and was treated as such although malarial parasites were not definitely detected in the blood. On the following day the symptoms were aggravated, and marked retraction of head and Kernig's sign were noticed. A lumbar puncture was performed; about 60 c.c. of C. S. fluid were withdrawn under high pressure. The fluid was very turbid and the diplococcus meningitidis intracellularis was detected microscopically.

During the first week the patient's condition was certainly bad, he being semi-comatose. Hyperæsthesia, marked retraction of head, strabismus, and unequal pupils were noticeable. An exception to the general rule of diarrhœa was observed in this case; the bowels were particularly costive, and a purgative had to be resorted to frequently. Catheterisation was also occasionally necessary. No rash was ever noticed.

There was a slight improvement during the second week, but patient fell back again in the third week.

Three lumbar punctures were performed, two during the first week and one in the third week; in each case the fluid was under considerable pressure. It will be noticed from the chart that these punctures had a direct bearing on the lowering of the temperature.

Progress steadily commenced after the last lumbar puncture, and by the beginning of the fourth week all symptoms subsided.

During the remaining period of his stay in Hospital, his progress was steadily maintained. Little or no quinine was administered during this time. Sequelæ noticed in this case were slight deafness, anæmia, debility, and an enlarged spleen; no appreciable sign of mental weakness was noticed.

Patient gave a previous history of malaria.

The disease seems endemic in East Africa among the natives, the mortality being between 60 and 80 per cent. This high mortality is partly due to the fact that the disease is generally incidental to the lower or ignorant class of native who is a very difficult subject to treat.

The clinical features of this disease are so characteristic that a microscopical examination of the C. S. fluid is frequently unnecessary as an aid to diagnosis, though a lumbar puncture should always when possible be performed not only as an aid to diagnosis, but also on account of its therapeutic value. I have always found that when the C. S. fluid is turbid and under high pressure the case is one of meningitis.

NOTE.—I am indebted to Lieut.-Colonel John McKie, D.S.O., R.A.M.C., Commanding 52nd (Lowland) Casualty Clearing Station, for his kindness in according me permission to publish this article.

Yours, etc.,  
W. T. BAMPTON,  
ASST. SURGEON, I.S.M.D.

#### SODIUM GYNOCARDATE IN LEPROSY.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I communicate this note to invite opinion on the value of sodium gynocardate in leprosy. It is now over a year since Leonard Rogers' first paper appeared on the subject (*B. M. J.*, October 21st, 1916), and many must have had opportunities for giving the drug a fair trial.

My experiences of the drug are limited to intravenous injection in selected cases of early and advanced nodular, nerve, and mixed leprosy.

By a singular coincidence, on the day when Rogers' paper first reached my hands, Mr. C. T. Symons, the Government Analyst, handed me a soap that he had prepared from the fatty acids of chaulmoogra oil at a suggestion I had made a couple of months previously. My choice of chaulmoogra soap for leprosy was founded on the premise that, if chaulmoogra (the only drug with anything like a decent reputation in leprosy) could be given intravenously in large doses like salvarsan, good results might be expected. As oils and fats are absorbed as soaps, obviously a soap of the fatty acids of chaulmoogra was what was required. Then came Rogers' article which added impetus to my zeal, if it at the same time caused me a slight feeling of disappointment that I had been forestalled.

I began with the solution prepared for me by Mr. Symons, and when I found his to fail, had recourse to Rogers' preparation which I procured from Messrs. Smith, Stainstreet & Co., with, I am sorry to say, the same results. I used a two per cent. stock solution and administered it once a week in doses varying from one to ten c. c. further diluted or not.

The reactions were always more or less severe, even when such small doses as one and-a-half or two c. c. were used. They consisted of chills, fever rising to anything from 99° to 103° F., headache, pains all over the body, vomiting, etc.; gastritis was frequent and distressing.

Results.—I have not had a single case in which any benefit accrued. After a prolonged course of several months there was nothing in the condition of the patients to encourage a continuance of treatment, but rather the reverse. Two of my cases of advanced nodular leprosy got decidedly worse and were converted from able-bodied men to bed-ridden decrepits suffering intensely with pains and softening swellings as well as abscesses and ulcers in various parts of the body, a condition from which they made a very tardy recovery.

At first I regarded this tendency of lepromata to break down as a hopeful sign of focal reaction, but soon had to abandon the idea in favour of emholie formations. It may be argued with justice that these violent sequelæ were due to the large dosage employed. Be that as it may, there were other cases—early ones—in which the dose used was half to two c. c.; but I have so far not observed improvement occur under these injections in any lesion of leprosy.

It will be interesting to know the experience of others; mine leads me to the conclusion that we must look elsewhere for the cure of leprosy.

COLOMBO,  
November, 1917.

Yours, etc.,  
R. L. SPITTEL, F.R.C.S.,  
Surgeon, General Hospital.

#### CASE OF CAROTID ANEURISM.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The following case of Carotid Aneurism seems worthy of publication.

Name, S. R.; Occupation, labourer, sailmaker. Age, 50 years; Place of birth, Tanjore (South India); Habits, temperate; Caste, Hindu.

The patient, whose particulars are given above, reported to me complaining merely of pain just below the angle of the right jaw, which interfered with, and was increased to some extent during, deglutition. Duration—one month. On examination, a small fusiform aneurism— $1\frac{1}{2}$ " by 1"—was discovered. It was distinctly of the right external carotid, and situated just above the branching away of the facial. There was no history of trauma or any venereal trouble. Heart, lungs, and kidneys were quite normal, and there was no evidence of any other arterial disease. The general condition of the patient was good. The right eye showed an interstitial keratitis which followed an attack of smallpox at the age of 20. The peculiar position of aneurism and the absence of any ætiology make it a case of interest and note.

BASRA. }  
Yours, etc.,  
G. F. DUCKWORTH,  
Assistant-Surgeon.

#### FAMILY EPIDEMIC OF SCARLET FEVER.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Scarlet fever is a widespread affection, occurring in nearly all parts of the globe and attacking almost all races. It is highly infectious. But India enjoys comparative immunity, as may be evident from the fact that seldom cases are reported in the Indian journals and periodicals, and the profession in general, as a rule, remains practically unconcerned.

The rarity of the disease in this great peninsula, inhabited by a heterogeneous population of varied colours and races, is an undisputed conclusion, but this does not bring us to the data that there are not occasional occurrences, undiagnosed and undetected.

Only some time ago a very interesting paper on this subject was read before the District Medical Association, by Col. J. Garvie, I.M.S., Civil Surgeon of Meerut, and I make no apology for taking from his notes the following case incidences, whose value may afford a clue to the undiagnosed fever cases so frequently seen in all parts of India.

The author of the paper, an experienced officer of long standing, observes at the outset that "for more than one reason it seems good to record an epidemic of scarlet fever in the United Provinces of India. As far as I know they are not common. As the narrative proceeds it will be seen that the first case in a baby would never have been explained except for those that followed."

He cited four cases in the course of his argument, and they are worthy of record.

**Case I.**—He was called in to see a baby, aged one year, in an American family. She had had fever for some four days which had not yielded to homely remedies. The symptoms were listlessness, fretfulness, and a general appearance of being ill. A blood film was taken, and diaphoretic given before the blood had been examined. On the sixth day the temperature fell to normal, and there was a discharge from one ear. Naturally these two facts were connected together, and it was thought the cause of the fever was due to infection of the middle ear. It was thought strange that the baby gave no sign of pain in the ear. There the case ended in the unsatisfactory way; so many do. We feel in many such cases baffled and even stupid, whereas the correct attitude, when we have given the case intelligent and full consideration, is one of humility and watchfulness before anything inexplicable in nature.

**Case II.**—The second case in the family when it arose did not lift the veil of obscurity. The mother fell ill with fever and sore throat. Some months before diphtheria of anomalous character had appeared in the next house, and one could not rule out of court at once that this case was not of this nature. Anti-diphtheretic serum was given, but this disease was believed not to be the cause of the illness, because there was no marked swelling of the throat nor of the neck, no diphtheria-like patches on the mucus membrane, and no rapidity of pulse. The throat was merely swollen and sore. Dengue was then suspected. This disease had appeared in epidemic form in this part of the country 3 years before after a lapse of 42 years. The lady was seen by an I. M. S. officer, who had dengue many times, and believed this to be the diagnosis. She was also seen by a civil practitioner and pronounced to be a case of streptococci infection.

Meanwhile the pulse rose from 80 to 120, and the case became an anxious one. The rash became unlike any dengue rash. The skin was generally red, and all the flexures of the limbs were markedly affected. This is a point to be remembered for the future in differential diagnosis.

In a day or so peeling set in, and the idea that this was a case of scarlet fever became assured for some days in one's mind.

**Case III.**—The only other child in the family then fell ill, and ran through a typical attack of scarlet fever. Rash, sore throat, fever, earache, peeling, all appeared as laid down in a text-book.

**Case IV.**—The head of the house, a man of 40 years, himself now fell ill. His case, as an example of an anomalous fever, is very interesting. He had little or no fever, only between 99° and 100°, a little sore throat for two days.

The eminent writer in concluding his observations says: "The origin is a mystery. The family are American. Did the infection arrive by letter from their home land."

As, sir, I confess I have never come across a single case of scarlet fever in Bengal or elsewhere since I have adopted the profession it would be monstrous to indulge in any discussion. But the notes on these four cases, however brief and incomplete they might be, are sufficient to form a basis for further elaboration, and to induce our worthy confreres to throw further light.

I am extremely grateful to Col. J. Garvie, I.M.S., for kindly permitting me to make use of his notes.

Yours, etc.,

INDIAN TROOPS WAR  
HOSPITAL, MEBRUT;  
19th November, 1917.

SATKARI GANGULI,  
Civil Sub-Assl. Surgeon.

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## To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—At a meeting held at the Medical College, Calcutta, on the 17th November, 1917, under the presidency of Lt.-Col. J. T. Calvert, M.B., I.M.S., a Committee was formed to be called the "Sir Pardey Lukis Memorial Committee," Medical College, Calcutta, with a view to raise funds to perpetuate the memory of Sir Pardey Lukis who was the Principal of the Medical College for nearly five years.

The Medical College and the Medical profession in general owe much to Sir Pardey Lukis, and the Committee think it fit and proper that the Memorial should take the practical form of a scholarship the value of which, it is hoped, will be consistent with its association with the illustrious name to which it will be dedicated, and with the dignity of the Calcutta Medical College.

It has also been decided by the Committee that in case of an All-India Memorial being raised, the surplus money obtained over and above that amount which, in the opinion of the Committee, is necessary for the endowment of a scholarship, shall be devoted to the All-India Memorial.

We are desired by the Committee to appeal to you as a friend and admirer of the late Sir Pardey Lukis and as one interested in the welfare of medical education, to help the Committee financially to accomplish its laudable object.

All contributions will be thankfully received and acknowledged by Rai Chunilal Bose Bahadur, Chemical Laboratory, Medical College, Calcutta.

MEDICAL COLLEGE,  
CALCUTTA:  
7th December, 1917.

Yours, etc.,  
F. O'KINEALY,  
CHUNILAL BOSE,  
Hony. Secretaries.

## Service Notes.

THE number of casualties to officers reported during the fourteen days, 24th October to 6th November 1917, inclusive, was 2,733, as follows:—

|           |     |     |     |       |
|-----------|-----|-----|-----|-------|
| Killed    | ... | ... | ... | 718   |
| Died ..   | ... | ... | ... | 27    |
| Wounded   | ... | ... | ... | 1,794 |
| Missing   | ... | ... | ... | 151   |
| Prisoners | ... | ... | ... | 43    |
| TOTAL     |     |     |     | 2,733 |

Among them were included 66 casualties to medical officers. The names are given below. All, unless otherwise stated, are temporary officers of the R.A.M.C. The number of Australians in the list, twelve, is very large.

**Killed and died of wounds.**—Major G. M. Hunt, M.C. (Australians); Captains A. M. Fisher, F. C. Davies, H. Gibson, (regular R.A.M.C.), F. B. Metcalfe (Australians), J. R. Tillet (Australians), J. Alston, M.C. (S.R.), J. Davie (Australians), W. Morrison, M.C., A. Z. Philips, D. J. Stephen, M.C., Surgeon Probationers J. Brown, (R.N.V.R.); I. C. C. Barclay, (R.N.V.R.); Lieutenant R. A. Rail, L.D.S. (Grenadier Guards), Sister E. M. Kemp (T.F.N.S.); Nurse L. K. Cooke, (Q.A.I.M.-N.S.R.).

**Died.**—Lieutenant W. C. Macmillan, I.S.M.D.; Lieutenant and Quartermaster H. Underwoods (R.A.M.C. regular).

**Wounded.**—Lieutenant-Colonels C. W. Thompson (Australians), P. J. Hanapir, D.S.O. (R.A.M.C. regular); Majors W. H. Rennick (Australians), W. R. Craig (Australians), T. J. Fuzell (Australians), T. M. Furber (Australians); Captains G. T. Baker, G. Craslaw, H. A. Higginson, H. Foxton, F. L. Newton (T.F.), P. R. Woodhouse, M.C., E. P. Dark, M.C., J. A. Liley, M.C., J. Howard, H. A. Macmillan (T.F.), F. C. Pridham, E. A. Lumley, G. A. Birmia, F. L. Biquell (Australians), T. Duncan, F. E. Keane, F. E. S. Willis, F. W. Stone, W. A. Todd, I. Faris, (New Zealanders), A. E. Pringle-Pattison, F. W. Fay, (Australians), H. F. Wilson, C. H. Breman, (S.R.), J. E. Cable, W. G. Gondie, H. B. Graham, E. B. Lueck, S. R. Glead, R. Mackinnon (S.R.), D. H. Russell, M.C., R. D. Nasmith, P. S. Parkinson (Australians), J. Arthur (T.F.), W. J. Nisbet, R. W. Ryan, W. Headman, H. C. Watson, Lieutenants A. P. Draper, J. N. Morris, G. E. Lloyd, M.C.; Surgeons R. E. Morgan (R.N.), T. N. McE. Ross, M.C. (R.N.), Surgeon-Probationer I. M. Thompson (R.N.V.R.).

**Prisoner.**—Captain H. Atkin.  
The destroyers, H. M. S. *Mary Rose* and H. M. S. *Strongbow*, in charge of a convoy of food ships, were sunk by two heavily armed German raiders, on 17th October, 1917. Most

of the convoy were also sunk, only three vessels escaped. The officers and men on the destroyers were almost all lost, but a few were picked up by a British patrol boat. Among those lost was Surgeon-Probationer Ivan C. C. Barelay, R.N.V.R., of H. M. S. *Mary Rose*. He was the youngest son of Mr. Charles Barelay, of Rosecray, Cowdenhatch, Surgeon Probationer I. M. Thomson, R.N.V.R., of H. M. S. *Stroughow*, was reported saved, but severely wounded.

Captain Frederick Charles Davies, R.A.M.C., was killed in action on 17th October, 1917, aged 33. He was the youngest son of William Davies, J.P., of Borth and Battersen, and was educated at Charing Cross Hospital, taking the M.R.C.S. and L.R.C.P. London, in 1908, and at Cambridge, where he graduated as M.A. in 1910, M.B. and B.C. in 1911, and D.P.H. in 1912, also getting the M.R.C.P. London, in 1914. After filling the posts of house surgeon, house physician, and medical registrar of Charing Cross Hospital, of resident medical officer and bacteriologist at the West Ham Corporation Isolation Hospital, and of clinical assistant at the Great Ormond Street Children's Hospital, he became medical adviser to the Cambridge Insurance Committee, and county tuberculosis officer. He joined the R.A.M.C. as a temporary Lieutenant on 10th August, 1914, in the first week of the war, and was promoted to Captain after a year's service.

Captain Harold Gibson, R.A.M.C., died of wounds on 17th October, 1917, aged 33. He was the younger son of Surgeon Lieutenant Colonel G. J. Gibson, R.A.M.C., retired, born on 21st September, 1884, and was educated at the London Hospital, and took the M.R.C.S. and L.R.C.P. (London) in 1907. He entered the R.A.M.C. as a Lieutenant on 29th July, 1907, and became Captain on 29th January, 1911. He was acting as a temporary Lieutenant-Colonel when killed.

Lieutenant Richard Angwin Rail, L.D.S., Grenadier Guards, was killed in action on 9th October, 1917, aged 29. He was the youngest son of Mr. John W. Rail, of Wycroft, Kenilworth, Cape Town, and was educated at the South African College, at Charing Cross Hospital, and at the Royal Dental Hospital, taking the L.D.S. of the Royal College of Surgeons, England, in 1911, after which he went into practice at Cape Town. He came home to join the army in February 1916, and got a commission in the Grenadiers, going to the front in July 1916. He was a well-known cricketer in South Africa, playing as a member of the Western Province Eleven.

Temporary Captain A. M. Fisher, R.A.M.C., was reported as killed in action, in the casualty list published on 24th October, 1917, and in that of 29th October Captains F. B. Metcalfe and J. R. Tillett, both of the Australian Army Medical Corps, were reported as having died of wounds; and Surgeon Probationer G. Brown, R.N.V.R., as killed. On 30th October Major G. M. Hunt, M.C., Australian A. M. C., was reported killed. Major Hunt was gazetted to the Military Cross on 18th April 1917.

Captain James Alston, M.C., R.A.M.C., was reported as killed in action, in the casualty list published on 29th October, 1917. He qualified as L.R.C.P. I. and L.R.C. S. I. in 1911, and joined the Special Reserve of the R.A.M.C. as a Lieutenant on 6th April, 1914, being promoted to Captain on completion of a year's service. He gained the Military Cross on 18th October, 1917.

Captain Evie John Kerr, Australian Army Medical Corps, was killed in action on 14th October, 1917, aged 25. He was the second son of Mr. John H. Kerr, of the Treasury, Melbourne, Australia, and was educated at Wesley College, Melbourne, and at Melbourne University, where he graduated as M.B. and B.S. in March 1915. After acting as resident surgeon and as resident physician at Melbourne Hospital, he took a commission in the Australian Army Medical Corps in January 1916, and sailed for Europe in the following June.

Lieutenant-Colonel James Joachim Nicholas, Australian Army Medical Corps, was killed in action by a shell on 25th September, 1917. He was born in the Riverina District of New South Wales in 1890, so was only 27. He was educated at Melbourne University, where he graduated with honours as M.B. and B.S. in 1911, afterwards serving as house surgeon and registrar at Melbourne Hospital. He joined the Commonwealth Military Forces before the war, and in August 1914 was gazetted Captain in No. 1 Australian Light Horse Field Ambulance. He served in this unit at Gallipoli. On 4th January, 1916, he was promoted Major and transferred to the 3rd Australian Field Ambulance, with which he served in France. In December, 1916, he was appointed D.A.D.M.S. to the 1st Australian Division, and some two months before his death was promoted to the rank of Lieutenant-Colonel, being the youngest officer of that rank in the Australian A. M. C.

Lieutenant William Caldwell McMillan, I.S.M.N., died of pneumonia on active service on 24th October, 1917. He was born on 18th April, 1872, educated at Calcutta, and attained the rank of warrant officer as fourth class Assistant Surgeon on 21st February, 1893. He was promoted to the first class on 21st February, 1912, and became Lieutenant and

senior Assistant Surgeon during the war. In the early part of the war he was stationed in Calcutta. He had been very successful in the study of Indian languages, having passed the High Proficiency test in Urdu, and the Higher Standard in Persian, Pushtu, and Panjabi.

Senior Sub-assistant Surgeon, first class, ranking as subadar, Gami Shankar was reported as having died on service in the casualty list published on 1st November, 1917. He was born on 21st May, 1868, entered the I.S.M.N. on 25th March, 1869, and attained that rank on 16th August, 1914. In the early part of the war he was serving in the Station Hospital at Jullundur. He had received the Indian Order of Merit, second class, during the war.

Lieutenant and Quartermaster Harry Underwood, R.A.M.C., died of dysentery on service in Egypt on 18th October, 1917. After serving in the ranks, he attained the rank of warrant officer as Sergeant-Major, on 12th October, 1914, and had since received a commission.

Captain William Gardiner McConnell, R.A.M.C., was reported as having died of wounds, in the casualty list published on 2nd November, 1917. He qualified as L.R.C.S.I. and L.R.C.P.I. in 1905, and immediately joined the R.A.M.C. as a temporary Lieutenant, and was promoted to Captain a year later. His name appeared in the list of wounded a fortnight previously.

Captain William Morrison, M.C., R.A.M.C., died in hospital of wounds and gas poisoning on 23rd October, 1917. He was the younger son of the late Rev. W. Morrison, of Mulben, Keith, and was educated at Milne's Institution, Fochabers, and at Edinburgh University, where he graduated as M.B. and Ch. B. in 1909, afterwards joining the British East Africa Medical Service. He took a temporary commission as Lieutenant in the R.A.M.C. on 17th March, 1915, was promoted to Captain on completion of a year's service, and gained the Military Cross on 25th November, 1916. He had served at the front for the past two years, except for a few months in the winter of 1916-17, when he was at home, recovering from shell shock.

Captain Abraham Zadok Phillips, R.A.M.C., died on 24th October, 1917, of the effect of gas poisoning on the previous day, aged 36. He was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1910, and as M.D., with commendation, in 1913, also taking the D. P. H. London, in 1914, and the F.R.C.S. Edin. in 1915. He afterwards filled the posts of house physician at the Royal Southern Hospital, Liverpool, and of house surgeon and house physician of the Liverpool infirmary for children. Early in the war he served as Surgeon to the Florence Fienues hospital at Dunkirk. In July 1915, he took a temporary commission as Lieutenant in the R.A.M.C., and was promoted to Captain after a year's service.

The annual obituary of graduates of Edinburgh University, dated 15th October, 1917, gives, without date, the name of Captain John Struthers, South African Medical Corps, as killed in action. He graduated as M.B. and Ch.B. at Edinburgh in 1894, and before the war was in practice at Neora, Cofimvaba, Tembuland, South Africa.

Captain David James Shirres Stephen, M.C., R.A.M.C., died of wounds and gas poisoning on 23rd October, 1917. He was educated at Aberdeen University, where he graduated as M.B. and Ch.B. in 1910, and as M.D. in 1912, afterwards filling the posts of senior house surgeon of Lincoln County hospital, and of assistant medical officer of the Lann Asylum at Lincoln. He joined the R.A.M.C. as a temporary Lieutenant on 10th October, 1914, and was promoted to Captain after a year's service. He gained the Military Cross on 24th July, 1915.

The number of casualties among officers reported during the fourteen days, 29th August to 11th September inclusive, was 2,416, of whom no less than 514 were included in the list published on 29th August. They may be tabulated as follows\*:-

|           |     |     |     |     |       |
|-----------|-----|-----|-----|-----|-------|
| Killed    | ... | ... | ... | ... | 617   |
| Died      | ... | ... | ... | ... | 22    |
| Wounded   | ... | ... | ... | ... | 1,494 |
| Missing   | ... | ... | ... | ... | 189   |
| Prisoners | ... | ... | ... | ... | 94    |
| Total     | ... | ... | ... | ... | 2,416 |

Among them were included 47 casualties to medical officers, as well as three among nurses. The names are given below. All, unless otherwise stated, are temporary officers of the R.A.M.C.

*Killed*.—Colonel T. Daly (R.A.M.C. regular, lost at sea); Captains H. D. Eccles, J. E. S. Wilson, M.C., J. H. Bampton, W. J. Anderson (East African Medical Service, accident), and Staff Nurse N. Spindler (Q.A.I.M.N.S.R.).  
*Died*.—Captains D. Arthur (I.M.S., as prisoner of war), A. Trill.

\* Lately received and accidentally omitted from November Number—ED., I. M. G.



*Missing.*—Lieutenant-Colonel G. S. Williamson (T.F.).  
*Prisoners.*—Captains, E. D. F. Hayes, H. K. Ward, M.C. (S.R.)

Colonel Thomas Daly, C.M.G., R.A.M.C., was reported in the list of casualties published on 30th August 1917, as drowned. He was lost in the Arcadian transport, when that vessel was torpedoed and sunk in the Mediterranean, on the way to Egypt, on 15th April, 1917. He was educated in Dublin, and took the L.R.C.S.I. in 1881, and the L.R.C.P.I. in 1882. Entering the army as Surgeon on 1st August, 1885, he became Surgeon-Major on 1st August, 1897, Lieutenant-Colonel on 1st August, 1905, and full Colonel on 1st March, 1915. He served in the Northern frontier of India, in the Tirah Campaign of 1897-98, receiving the medal with a clasp; and in South Africa from 1899 to 1902, taking part in the operations in the Orange Free State including the action at Bethlehem, in the Transvaal, and in Cape Colony, was mentioned in despatches, and received the Queen's Medal with three clasps and the King's Medal with two clasps. He joined the Expeditionary force in France in December 1914, was mentioned in despatches in the *London Gazette* of 13th November, 1916, and received the C.M.G. on 1st January, 1917. From 14th June, 1915, he had been serving as A.D.M.S. with a division of the New Army.

Captain James Ernest Studholme Wilson, M.C., R.A.M.C., attached Oxford and Bucks Light Infantry, died of wounds in hospital abroad on 23rd August, 1917. He was the elder son of the late Revd. Studholme Wilson, of Stoneleigh, Newport, Salop, and was educated at the London hospital. After taking the M.R.C.S. and L.R.C.P. London, in 1911, he went into practice at Ivor, in Buckinghamshire, where he was medical officer of the Iver, Denham, and Langley Cottage hospital, and of the Alexandra House home for feeble-minded girls. He took a temporary commission in the R.A.M.C. in the latter half of 1915, was promoted to Captain after a year's service, and received the Military Cross on 22nd September, 1916.

Captain Anthony Traill, R.A.M.C., temporary, died at a casualty clearing station of internal hemorrhage on 25th August, aged 27. He was the son of Edmund B. Traill, of Peblmarsh, Essex, and of Chirru, Traill, Argentina. He qualified as L.M.S.S.A. in 1915, and joined the army soon after.

Captain Horace Dorset Eccles, R.A.M.C., was reported as killed in action, in the casualty list published on 23rd August, 1917. He was educated at Guy's Hospital, took the M.R.C.S. and L.R.C.P. London, in 1893, and went to New Zealand, where he was in practice at Kawa-Kawa, Bay of Islands, till he joined the army as a temporary officer.

Captain James Henry Bampton, R.A.M.C., was reported as having died of wounds, in the casualty list published on 6th September, 1917. He was educated at Birmingham University, where he gained the Walter Myers scholarship, and graduated as B.Sc. in 1908, and as M.B. and Ch.B. in 1911, afterwards studying at Bern. After serving as house surgeon of the Birmingham General Hospital, he settled at Gravelly Hill, Birmingham, holding the post of assistant school medical officer of Birmingham. He took a temporary commission in the R.A.M.C. as Lieutenant on 1st February, 1915, was promoted to Captain on completion of a year's service, and when killed was attached to the Royal Field Artillery.

Captain W. J. Anderson, East African Medical Service, was reported as accidentally killed, in the casualty list published on 10th September, 1917.

#### FOREIGN DECORATIONS.

##### French.

*Légion d'Honneur.*—*Croix de Chevalier*: Major (temporary Lieutenant-Colonel) A. B. Fry, I.M.S.

*Croix de Guerre.*—Captain A. L. Robertson, R.A.M.C., S.R.; temporary Captain J. W. Edington, R.A.M.C.; temporary Lieutenant W. McKee, R.A.M.C.; Captain W. L. Murphy, R.A.M.C.; temporary Lieutenant D. G. C. Tasker, R.A.M.C.; Captain L. D. Bailey, R.A.M.C.; temporary Lieutenant R. N. Kapadia, I.M.S.; Captain A. W. Forrester, Medical Officer, Rhodesian Native Regiment; Captain F. W. Hay, I.M.S.; Captain J. B. Lapsley, I.M.S.; temporary Major T. M. R. Leonard, West African Medical Service, attached Nigerian Contingent.

##### Italian.

*Order of the Crown of Italy.*—*Cavalier*: Major (temporary Lieutenant-Colonel) W. H. Hamilton, D.S.O., I.M.S.  
*Silver Medal for Military Valour.*—Captain C. A. Godson, I.M.S.

##### Egyptian.

*Order of the Nile.*—*Third Class*: Major R. B. Black, D.S.O., late Egyptian Army and Sudan Government Service. *Fourth Class*: Captain C. M. Drew, R.A.M.C., late Medical Corps, Egyptian Army; Captain D. S. Buist, R.A.M.C., Medical Corps, Egyptian Army; Captain E. M. Parsons-Smith, R.A.M.C., Medical Corps, Egyptian Army.

##### Belgian.

*Order of Leopold.*—Commander: Surgeon-General Sir A.W. May, K.C.B., K.H.P.

*Order of the Crown.*—Commander: Deputy Surgeon-General J. P. McNabb, R.N. Officer: Fleet-Surgeon K. H. Jones, R.N.

THE following extract is published for general information:—

*London Gazette of the 6th July, 1917, page 6710.*

India Office,  
 6th July, 1917.

#### ROYAL WARRANT.

WHEREAS We deem it expedient to amend Our Warrant of 25th June, 1907, under which the Indian Distinguished Service Medal may be awarded to Indian commissioned and non-commissioned officers and men of Our Indian Regular Forces, including the reserve of the Indian Army, Border Militia and Levies, Military Police and Imperial Service troops, for distinguished service in the Field.

Our Will and Pleasure is that Indian non-combatants attached to Forces engaged on field service shall be included amongst the classes eligible for the aforesaid Medal; and further, that where Indian commissioned and non-commissioned officers and men, including non-combatants attached to Forces engaged on field service, who are in possession of Medals for Distinguished Service awarded under Our Warrant of 25th June, 1907, or this Our Warrant, have been recommended on account of further distinguished service, a Bar shall be added to the Distinguished Service Medal already conferred.

Given at Our Court at Buckingham Palace, this Thirtieth day of June, in the Eighth year of Our reign and in the year of Our Lord 1917.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, I.M.S., with effect from the dates specified:—

Coimbatore Subramania Venkataramanan, 11th September, 1917; Dharendra Prasad Bose, 12th September, 1917; Vellathusseri Chakalambil Govinda Menon, 12th September, 1917; Nibaran Chandra Mitra, 15th September, 1917; Manmatha Nath Chatarji, 26th September, 1917; Vadakke Kurupath Kochukrishna Menon, 26th September, 1917; Hanumanthayya Krishnan, 27th September, 1917; Viaculathoor Ramasami Sundaresan, 27th September, 1917; Giddu Siva Ram, 28th September, 1917; Chakrat Govinda Menon, 29th September, 1917; Devindra Singh Otto, 30th September, 1917; Edakolathur Kuriakku Thomas, 1st October, 1917; Kusbakht Rai, 3rd October, 1917; Janna Das, 4th October, 1917; Kandathil Mathew Mathulla, 6th October, 1917; Raja Singh, 6th October, 1917; Lal Gopal Banerjee, 9th October, 1917; and Gorur Srinivasamurti, 12th October, 1917.

#### INDIAN MEDICAL SERVICE.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified:—

James Freer Richardson, 17th July, 1917; Rugh Nath Rai, 1st October, 1917; Peruvemba Ayyasami Aiyer Ramanathan, 10th October, 1917; Puthukkeril Koshy Koshy, 11th October, 1917; Villapuram Rajaratna Natesan, 15th October, 1917; Sivasubramanya Pillay Kanthimathinathan, 17th October, 1917; Bagepalli Venkatavarada Acharya, 18th October, 1917; Koladi Gopal Menon, 18th October, 1917; Ravanamasudram Sundaramayyar Harihar Ayyar, 20th October, 1917; Sukumar Saunyal, 25th October, 1917; Kali Prasad Bagchi, 28th October, 1917.

Subject to His Majesty's approval, the undermentioned to be honorary temporary Captain for the period of his honorary services in the Marine Lines War Hospital at Bombay, with effect from the date specified:—

Cajetan Fernandes, 20th October, 1917.

THE following *communiqué* will be read with satisfaction:—

"With the approval of the Secretary of State for India, the Government of India have decided to adopt the following temporary measures for the promotion of Lieutenants of the Indian Medical Service. Permanent Lieutenants of the Indian Medical Service who were appointed prior to January 1st, 1917, shall be eligible for promotion to the rank of Captain after one year's service, subject to the limit of September 1st, 1915, for purposes of seniority and September 1st, 1916, for purposes of pay. Those appointed on or after January 1st, 1917, will be required to serve the usual three years in the rank of Lieutenant before becoming eligible for

promotion. Officers of the Indian Medical Service who have been appointed permanently by nomination during the period of the present war will count for promotion their previous military service during the war rendered after July 16th, 1915. Temporary Lieutenants of the Indian Medical Service who were appointed prior to January 1st, 1917, shall be eligible for promotion to the rank of Captain on completion of one year's service. Those employed on or after 1st January, 1917, shall be eligible for promotion to the rank of Captain on completion of three years' service. Rates of pay will remain unaffected on promotion. It has been decided that officers of the Indian Medical Service, with effect from the commencement of the war, shall be given acting rank in the field to the same extent as the Royal Army Medical Corps. These measures are only for the period of the war."

THE following is the able reply of Hon'ble Colonel H. Hindley to a resolution moved in the Punjab Legislative Council by the Hon'ble Mr. Fasil-Hossain on the appointments of Professors in the Lahore Medical College:—

"Your Honour, seeing that the question raised in this resolution and the amendment is dealt with in the recommendations made by the Public Services Commission, the Local Government, though willing it should be discussed in the Council, is not disposed to make any pronouncement in connection with it, while these recommendations are still under the consideration of the Government of India and if pressed to a division the official members will not vote. In view, however, of its importance as affecting the efficiency of the Government Medical College, which is the only channel through which medical men can enter the profession in the Punjab, it is as well the Council should be put into possession of certain aspects of the case that may be of assistance in the discussion."

"Appointment to the chairs of Anatomy and Physiology is made by the Government of India. The Punjab Government, if it has a suitable Indian Medical Service officer in view, can nominate him, and no doubt, unless the Government of India had an officer with more suitable qualifications available, it would accept the Punjab Government's nomination. The Government of India, in consultation with the Secretary of State, decides what appointments should be recruited for through the Indian Medical Service."

"There are 770 officers in the Indian Medical Service, a service which is open to all duly qualified natural born subjects of His Majesty of European or East Indian descent, and yet only two or three of the special anatomy appointments in India are reserved for them. In this large number of officers there are no doubt some always available with very special qualifications in Physiology and Anatomy, men probably who entered the service mainly with a view to work in these special departments. These appointments and others similar to them are what the Secretary of State has to attract young practitioners when he recruits officers for service in the Army in India and if the service is deprived of these special appointments in order to give them to other practitioners, who, if they wanted such appointments, might have entered the Indian Medical Service, and borne their share in the heat and burden of the day in military, plague or other disagreeable service, the question may well arise, will the Secretary of State still be able to induce highly qualified men to enter it?"

"Under the present system we may say that hitherto only accomplished anatomists have occupied the chair of Anatomy at Lahore, at least two of whom entered the service hoping for such an appointment. Amongst others I might mention Major Neil, Major Lawrie, Major Perry, names of men well known in and outside the Punjab, Sir Havelock Charles, to whom we owe in the main our magnificent anatomical rooms, and Colonel Lamont, who, at the outbreak of war, patriotically left a similar appointment in Scotland which he was filling with ease and dignity to take up his old duties in Lahore. Would there be great hopes of recruiting men equal to or better than these from the ranks of medical men outside the Indian Medical Service?"

"Will the proposal before us make for efficiency? It is probably known why, as a subject, anatomy is so important and why such great emphasis is laid on an accurate knowledge of it; as illustrating this take quite a small operation, the removal of a gland from the neck, the surgeon with his accurate knowledge of anatomy avoids a dangerous issue by the one-sixteenth of an inch or so; had he not the knowledge gained in the dissecting room or been badly taught would this have been possible?"

"The science of physiology has made such strides within the last generation or so as to have almost completely revolutionized treatment and made it necessary that it should be taught by men well versed in the latest developments and prepared to keep in touch with them."

"But supposing we put into the appointments at Lahore a good anatomist or physiologist it does not follow that he will be a good teacher; take a case which has actually occurred

in India. Such a man, he did not belong to the Indian Medical Service, was found after several years from the failure of his students to pass their examinations to have been all along inefficient as a teacher. This only came out gradually and in the meantime think of the injury done to the students and to the patients they had to attend when they eventually qualified. Some will no doubt say that this might happen with an Indian Medical Service officer, possibly, but remember he has been under the notice of the authorities (responsible for appointing him) for some years, he will have shown his ability, his sense of discipline, and, probably by acting in appointments, his teaching powers, and then, this is a very important point, he can be transferred to another appointment of a different kind should any doubt arise as to his efficiency: whereas in the other case the College is probably tied to him indefinitely or until his agreement expires."

"Then in our College and School we have, as I dare say this Council is well aware, difficult elements that are anything but easy to deal with; here in the Punjab we have students who tend to be unruly, not unexpectedly, perhaps, as many of them come of the fighting classes. The pupil is introduced into the dissecting room and into the Physiological Laboratory early in his career as a medical student; he has little idea of discipline and he is allowed a freedom previously unknown to him. If he comes under the influence of a man with a strong sense of discipline who has his respect, he will probably do well; but leave him to a man who is himself inexperienced and has not had the disciplined training an Indian Medical Service officer must have had, the result may be disastrous not only to the youth but to the College. The Professors of Anatomy and Physiology are in a very independent position, they have complete control of these young men for many hours at a most impressionable time in their careers, and if they fail then failure has a greater effect upon the reputation of the College and of the student, and is of far more reaching effect upon the lives of people than probably would be the case by the failure of any other professors in any other profession."

"The resolution and the recommendations of the Public Services Commission would have the effect of throwing a much greater degree of responsibility upon the shoulders of those responsible for making these appointments and would besides subject them to the possibility of much unfavourable criticism should they decide in favour of a service man. There would be too no doubt much difficulty experienced in recruiting for services in which the statutory numbers could never be accurately stated, and in arranging for leave vacancies or a reserve in case of sickness, details that can be worked out, but any one with experience of the working of a service knows how very difficult they are to deal with in practice."

"As the war is not yet over it would be idle to speculate as to how admittedly changed conditions will affect the Public Services Commission's recommendations. It is certain, however, that it will be difficult for years to come to fill up casual medical appointments in India by young men of established reputation. It is estimated that only 519 male medical students will pass out in England in 1919, whereas the normal wastage, not war wastage, is but little short of double that number. It would seem that our only hope therefore is that there may still be men looking to join a service, in spite of the increased attractions in civil life, for the security it offers of an assured future and prospective pension."

"Throughout these remarks it is assumed that candidates for these appointments would be required to have received their professional education in Europe and to have had experience in similar appointments in recognised British Medical Schools to meet the requirement of the University whose degrees are registrable under the British Acts."

THE undermentioned gentlemen have been appointed permanently to the Indian Medical Service as Lieutenants, by the Right Honorable the Secretary of State for India, subject to His Majesty's approval. Their commissions will bear date 23rd January 1917:—

Jelal Mochool Shah; Rostam Merwan Kharegat, M.B.; Lakshminarayanapuram Subramaniam Ramier, M.B.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants with effect from the dates specified:—

Anng Tun. 9th August 1917: Karumacheril Itty John, 22nd August 1917; Ramendra Krishna Basu, 29th August 1917; Austin D'Silva, 10th September 1917; Nathan Elijah, 11th September 1917; Gianchand Bhawandas Advani, 12th September 1917; Shrivshankar Vithalji Trivedi, 12th September 1917; Krishna Venkatachalam, 14th September 1917; Enathickal John Koshi, 17th September 1917.



THE services of Dr. A. E. Moore, M.R.C.S., L.R.C.P., are replaced at the disposal of the Government of the Punjab, with effect from the 1st October 1917.

War Office, 17th September 1917.

HIS Majesty the King has been graciously pleased to approve of the undermentioned rewards for distinguished service in the field:—

*To be Brevet Lieutenant-Colonel.*

MAJOR (temporary Lieutenant-Colonel) R. M. Carter, F.R.C.S., Indian Medical Service (with effect from 26th April 1916, inclusive).

*To be Companion of the Distinguished Service Order.*

Major Robert Archer Lloyd, M.D., Indian Medical Service.

THE following are among the Decorations and Medals awarded by the Allied Powers on various dates to the British Forces for distinguished services rendered during the course of the campaign:—

HIS Majesty the King has given unrestricted permission in all cases to wear the Decorations and Medals in question.

*Decorations and Medals presented by*

**THE PRESIDENT OF THE FRENCH REPUBLIC.**

*Croix de Guerre.*

Major (temporary Lieutenant-Colonel) Leonard Joseph Montagu Deas, M.B., F.R.C.S., Indian Medical Service.

War Office, 15th August 1917.

THE Secretary of State for War has received the following list of names of officers, warrant and non-commissioned officers and men, ladies and civilians, whose services have been brought to notice by Lieut.-General Sir Stanley Maude, K.C.B., Commander-in-Chief, Mesopotamia Expeditionary Force, as deserving of special mention:—

*Indian Medical Service.*

Brevet Lieutenant-Colonel S. Anderson, M.B.; Captain C. H. N. Baker, Temporary Lieutenant S. D. Billimoria, Captain H. H. Brown, Brevet Lieutenant-Colonel (temporary Colonel) G. Browne, M.D.; Captain H. Chand, Major M. N. Chaudhuri, M.D.; Major F. P. Connor, F.R.C.S.; Major S. R. Christophers, C.I.E., M.B.; Major (acting Lieutenant-Colonel) L. J. M. Deas, M.B., F.R.C.S. (Edin.); Temporary Lieutenant A. J. D'Souza, Major H. Falk, M.B.; Major (acting Lieutenant-Colonel) A. B. Fry, M.D.; Lieutenant-Colonel F. W. Gee, M.B.; Captain (acting Lieutenant-Colonel) H. R. B. Gibson, M.B.; Brevet Lieutenant-Colonel O. M. Goodbody, D.S.O., F.R.C.S.I.; Major S. R. Godkin, F.R.C.S.I.; Captain C. A. Godson, Captain P. F. Gow, D.S.O., M.B.; Major (temporary Lieutenant-Colonel) J. D. Graham, M.B.; Major (temporary Lieutenant-Colonel) W. H. Hamilton, D.S.O., F.R.C.S.; Major W. F. Harvey, M.B.; Major A. W. M. Harvey, M.B.; Captain C. G. Howlett, M.B.; Lieutenant-Colonel E. V. Hugo, M.D., F.R.C.S.; Lieutenant-Colonel (temporary Colonel) G. B. Irvine, C.B.; Captain G. G. James, M.B.; Lieutenant-Colonel T. B. Kelly, F.R.C.S. (Edin.); Major (acting Lieutenant-Colonel) W. D. A. Keys, M.D.; Major (acting Lieutenant-Colonel) J. C. H. Leicester, M.D., F.R.C.S.; Major R. A. Lloyd, M.B.; Captain G. R. Lynn, M.B.; Captain L. H. L. Mackenzie, M.B.; Lieutenant-Colonel R. H. Maddox, M.B.; Temporary Lieutenant R. C. Malhotra, M.B.; Lieutenant-Colonel F. O. N. Mell, M.B.; Major H. M. H. Melhuish, Lieutenant-Colonel H. G. Melville, M.D., F.R.C.S. (Edin.); Captain S. H. Middleton-West, M.B.; Captain P. S. Mills, M.B.; Major D. Munro, M.B., F.R.C.S. (Edin.); Captain A. H. Napier, M.B.; Lieutenant-Colonel B. Nanth, Captain J. J. H. Nelson, M.D., F.R.C.S. (Edin.); Lieutenant-Colonel (temporary Colonel) W. H. Ogilvie, M.B.; Major T. G. F. Paterson, M.B.; Lieutenant-Colonel E. L. Perry, Captain J. A. S. Phillips, Major A. H. Proctor, M.D.; Captain C. H. Reinhold, F.R.C.S. (Edin.); Lieutenant B. H. Singh, Captain N. S. Sodhi, Lieutenant-Colonel F. H. Watling, M.B.; Major T. S. B. Williams, M.B.; Lieutenant-Colonel (temporary Colonel) C. N. C. Wimberley, M.B.

*British Red Cross Society.*

Lieutenant-Colonel J. Gould, M.B., I.M.S.

**INDIAN SUBORDINATE MEDICAL DEPARTMENT.**

Senior Assistant Surgeon and Honorary Lieutenant E. J. Archer; Senior Assistant Surgeon and Honorary Lieutenant H. V. Dewey; Senior Assistant Surgeon and Honorary

Captain H. G. C. Mills; 3rd Class Assistant Surgeon J. M. M. Brown, 1st Class Assistant Surgeon A. E. Clarke, 2nd Class Assistant Surgeon E. A. Cotton, 4th Class Assistant Surgeon A. N. De Monte, 2nd Class Assistant Surgeon G. W. Doyle, 1st Class Assistant Surgeon H. J. J. Garrod, 3rd Class Assistant Surgeon, J. S. Gloria, 4th Class Assistant Surgeon J. G. Goodman, 4th Class Assistant Surgeon R. D. Mason, 3rd Class Assistant Surgeon A. E. Mathews, 2nd Class Assistant Surgeon P. J. McGiath, 4th Class Assistant Surgeon J. P. McGuire, 4th Class Assistant Surgeon S. W. A. Monl, 2nd Class Assistant Surgeon S. C. Raphael, 4th Class Assistant Surgeon W. H. Thynne, 4th Class Assistant Surgeon A. R. Underwood; No. 1065 1st Class Sub-Assistant Surgeon Abdur Razzak; No. 863 1st Class Sub-Assistant Surgeon Bhaya Lal; No. 388 3rd Class Sub-Assistant Surgeon Chuni Lal Himmatram Bhatt; No. 1041 1st Class Sub-Assistant Surgeon Dayal Singh; No. 1169 2nd Class Sub-Assistant Surgeon Rai Sahib Deoraj; No. 1331 2nd Class Sub-Assistant Surgeon Gujjamal Varma; No. 252 1st Class Sub-Assistant Surgeon E. James; No. 1014 1st Class Sub-Assistant Surgeon Kehar Singh; 1st Class Senior Sub-Assistant Surgeon Kishan Chand; 1st Class Sub-Assistant Surgeon (Burma) Mung-Tha U; No. 263 1st Class Sub-Assistant Surgeon Mohan-Lal Nagesar Shukla; No. 1193 2nd Class Sub-Assistant Surgeon Mul Singh; No. 365 2nd Class Sub-Assistant Surgeon Ramchandra Bhaurao Shinde; No. 321 2nd Class Sub-Assistant Surgeon Ram Krishna Anant Parab; No. 798 1st Class Sub-Assistant Surgeon Rawail Singh; No. 1402 3rd Class Sub-Assistant Surgeon Sudhirsar Sen Gupta; No. 1410 2nd Class Sub-Assistant Surgeon Singlon Vyasam Venkataramayya; No. 1236 2nd Class Sub-Assistant Surgeon Shamsher Jaug; No. 1406 3rd Class Sub-Assistant Surgeon Suraj Pal; No. 422 2nd Class Sub-Assistant Surgeon Vaishno Ram; No. 852 1st Class Sub-Assistant Surgeon Wahidyar Khan.

**WARD SERVANTS AND ORDERLIES.**

No. 2158 Havildar, Indian Infantry, Baldeo Singh; No. 1206 Assistant Cook, A. H. C. Behri; No. 991 1st Grade Storekeeper, S. & T. Corps, Bhagwan Dass Nagpal; No. 901 Sepoy, Indian Infantry, Chuni Lal; No. 1293 2nd Grade Ward Sweeper, A. H. O. Dowlatt; No. 2422 Havildar, Indian Infantry, Inder Singh; No. 840 Sepoy, Indian Infantry, Jug Lal; No. 4087 1st Grade Ward Servant Kamaruddin; No. 5803 Havildar, Indian Infantry, Karim Khan; No. 3423 Havildar, Indian Infantry, Labha Singh, No. 1567 Sepoy, Indian Infantry; Mannu Lal Tewara; No. 1053, 1st Grade Hospital Storekeeper, Manohar Lal; No. 1500 Sowar, Indian Infantry, Mohammed Ismail; No. 3284 Sepoy, Indian Infantry, Sheodan Singh; No. 1481 Havildar, Indian Infantry, Vir Singh; No. 600 Hospital Writer, W. E. Hermon; No. 2917 Sepoy, Indian Infantry, Clerk, Munsab Ali; No. 4171 3rd Grade Water Carrier, A. H. O. Ohtn; No. 729 M.T. Sweeper, S. & T. Corps, Mukwa; No. 1130 Bhisti, S. & T. Corps, Ramzan, Bhisti, Indian Infantry, Ratanbir Thapa.

**ARMY BEARER CORPS.**

No. 4982 Bearer, Buthi Rani; No. 7224 Bearer, Chetan; No. 4645 Bearer, Golam Mohamed; No. 7019 Lce.-Naik, Gnnai; No. 7747 Bearer, Hemsraz; No. 13046 Bearer, Kishan Bahadur; No. 9653 Bearer, Lotai; No. 8192 Bearer, Mahabir; No. 7018 Naik, Mangta; No. 7051 Naik, Misri; No. 707 Lce.-Havildar, Nannu; No. 9355 Bearer, Pundi Sammel; No. 18171 Bearer, Rambao Lal; No. 4979 Bearer, Shankar Sing; No. 8031 Bearer (acting Naik), Sheo Govind; No. 8111 Bearer, Sheo Lal; No. 7043 Lce.-Naik, Talsi.

THE following notifications in the Gazette of India are important and will remove a very real grievance of the officers concerned. It can only be realised by consultation of the Army List, e.g., take the case of Major W. M. Pearson, whose minority is now antedated to 24th July, 1910. He entered the service on 28th January, 1899, and was entitled to usual promotion on 28th January, 1911; he now gets 6 months accelerated promotion to 28th July, 1910, and soon:—

Army Department Notification No. 282, dated 7th April, 1911.

Army Department Notification No. 82, dated 19th January, 1917.

Army Department Notification No. 85, dated 3rd February, 1911.

Army Department Notification No. 748, dated 2nd September, 1911.

Army Department Notification No. 655, dated 5th July, 1912.

Army Department Notification No. 96, dated 3rd January, 1913.

Army Department Notification No. 559, dated 27th June, 1913.

Army Department Notification No. 122, dated 6th February, 1914.

Army Department Notification No. 682, dated 31st July, 1914.

With reference to the notifications quoted in the margin the promotion to their present rank of the undermentioned officers is antedated as shown against their names:—

Major William MacMullen Pearson, M.B., from 28th January, 1911 to 28th July, 1910; Major William Ernest McKechnie, M.B., from 27th July, 1911 to 28th January, 1911; Major Alfred Spittler, M.B., from 28th June, 1912, to 28th December, 1911; Major Norman Septimus Wells, M.B., from 29th January, 1913 to 29th July, 1912; Majors John Kenneth Sprat Fleming, Evelyn Charles Hepper, Christopher Birdwood McConaghy, M.B., Laurence Percival Brassey, M.B., Colin Forbes Marr, M.B., from 27th June 1913, to 27th December, 1912; Majors Samuel Herbert Lee Abbott, M.B., Richard James Bradley, M.B., John William McCoy, Thomas George Ferguson Peterson, M.B., Dewan Ganpat Rai, from 29th January, 1914 to 29th July, 1913; Majors Alfred John Vernon Betts, M.B., Behramji Barjorji Paymaster, John Forrest, M.B., Daniel Stanislaus Aloysius O'Keeffe, M.B., from 26th July, 1914 to 26th January, 1914.

Army Department Notification No. 82, dated 19th January, 1917.

Army Department Notification No. 910, dated 9th October, 1914.

Army Department Notification No. 1006, dated 15th October, 1915.

Army Department Notification No. 168, dated 12th February, 1915.

Army Department Notification No. 810, dated 3rd September, 1915.

Army Department Notification No. 123, dated 4th February, 1916.

Army Department Notification No. 1163, dated 29th September, 1916.

Army Department Notification No. 273, dated 24th February, 1917.

With reference to the notifications quoted in the margin the promotion to their present rank of the undermentioned officers is ante-dated as shown against their names:—

Majors Vincent Blomhart Nesfield, F.R.C.S., George Adam Jolly, M.B., F.R.C.S.E., Cecil Edward Bulteel, Frederick Collins Rogers, from 1st September, 1914 to 1st March, 1914; Major Charles Gibbons Seymour, from 31st January, 1915 to 31st July, 1914; Majors Gordon William Maconachie, M.B., Charles Isherwood Brierley, Edward Temple Harris, M.B., from 31st August, 1915 to 28th February, 1915; Majors Hugh Watts, M.B., William Thomas McCowen, Edmund Arthur Roberts, from 30th January, 1916 to 30th July, 1915; Majors Horace Sidney Matson, M.B., Francis Hugh Stewart, M.B., Alfred Henry Proctor, M.D., Robert Tait Wolls, M.B., Ian Macpherson Maorae, M.B., Francis Broughton Shettle, from 1st September, 1916 to 1st March, 1918; Majors Arthur Francis Hamilton, M.B., F.R.O.S., Arthur Anderson McNeight, M.B., from 1st February, 1917 to 1st August, 1916.

The following announcement will be read with satisfaction:—

*London Gazette, dated the 25th September, 1917, page 9878.*

#### ROYAL WARRANT.

WHEREAS it has been represented to us that it is expedient to grant the honorary rank of Major to all Commissaries of Indian Army Departments, and certain senior assistant surgeons of the Indian Subordinate Medical Department;

Our will and pleasure is that—

(i) an officer serving in an Indian Army Department as a Commissary shall be granted the honorary rank of Major irrespective of his period of commissioned service on full pay.

(ii) the honorary rank of Major shall be granted to a senior assistant surgeon of the Indian Subordinate Medical Department on completion of three years' service in the honorary rank of Captain.

Our warrants dated the second day of January, 1904, and the twenty-sixth day of September, 1911, shall be amended accordingly.

Given at Our Court at *St. James's* this, twenty-first day of September, 1917, in the eighth year of our reign.

DOCTOR J. F. D'MELLO is appointed to act as Health officer, Mussoorie, with effect from the 22nd October, 1917, *vice* Doctor R. N. Rai, transferred to military duty.

THE designation of Imperial Bacteriologist, Muktesar Laboratory, is changed to Director and First Bacteriologist, Muktesar Laboratory.

ON return from leave Lieutenant-Colonel A. W. T. Buist, I.M.S., was posted to Rawalpindi as Civil Surgeon.

CAPTAIN T. H. DICKSON, R.A.M.C., is appointed to hold medical charge of the Civil Station of Dum-Dum, with effect from the forenoon of the 1st November, 1917, *vice* Captain C. Webb-Johnson, R.A.M.C. (T. F.).

MAJOR A. DENHAM WHITE, I.M.S., is appointed to be Resident Medical Officer, Medical College Hospitals, Calcutta, with effect from the forenoon of the 20th October, 1917.

MAJOR F. W. KENDLE, R.A.M.C., is appointed to hold medical charge of the Civil Station of Barrackpore, with effect from the afternoon of the 16th October, 1917, *vice* Captain T. H. Dickson, R.A.M.C.

HIS Excellency the Governor of Bombay in Council is pleased to appoint Major L. T. R. Hutchinson, M.D., B.C. (Cantab) D.Ph. (Cantab.), I.M.S., to act as Presidency Surgeon, Second District, with attached duties, in addition to his own duties, *vice* Lieutenant-Colonel M. P. Khareghat, I.M.S. (retired), pending further orders.

MAJOR H. CROSSLE, Indian Medical Service, an Agency Surgeon of the 2nd Class, is posted as Joint Civil Surgeon, Peshawar, with effect from the 15th October, 1917.

CAPTAIN E. E. DOYLE, I.M.S., and Assistant Surgeon G. J. Cowper have passed the Higher Standard in the Baluchi Language.

MAJOR E. T. HARRIS, M.B., I.M.S., was mentioned in East Africa Despatches (War Office, 22nd September, 1917) "for distinguished service in the Field."

MAJOR H. ROSS, M.B., F.R.C.S.I., I.M.S., Additional Assistant Director-General, Indian Medical Service, is appointed to be Deputy Director-General, Indian Medical Service, substantively *pro tempore*, with effect from the 24th November, 1917, until further orders.

WITH effect from the 30th October, 1917, Lieutenant-Colonel W. H. E. Woodright, I.M.S., Civil Surgeon, 2nd Class, to be Civil Surgeon, 1st class, substantively *pro tempore*, *vice* Lieutenant-Colonel H. B. Melville, I.M.S., whose services have been placed at the disposal of the Government of India, Foreign and Political Department.

THE services of Major A. S. M. Peebles, I.M.S., Superintendent, Central Lunatic Asylum, Berhampore, are replaced at the disposal of the Government of India in the Home Department, with effect from the forenoon of the 15th December, 1917. Major O. St. John Moses, I.M.S., will act for Major Peebles, and is also appointed to act as Civil Surgeon of Murshidabad, in addition to his own duties.

LIEUTENANT-COLONEL H. B. MELVILLE, Indian Medical Service, is appointed to officiate as an Agency Surgeon of the Second Class and is posted as Residency Surgeon in Kashmir, with effect from the 12th November, 1917.

#### MENTIONED IN E. A. DESPATCHES.

I have the honour to transmit herewith a despatch from Brigadier-General Edward Northey, C.B., A.D.C., in which he submits the names of various officers, non-commissioned officers and men serving under him for mention in despatches. The despatch reached me only on the 26th instant.

#### INDIAN SUBORDINATE MEDICAL DEPARTMENT.

Bir Singh, Jemadar, second class, Senior Sub Assistant Surgeon.  
Kishan Singh, No. 1070, first class Sub-Assistant Surgeon.

CAPTAIN D. C. V. FITZGERALD, M.C., I.M.S., temporary Deputy Medical Store-keeper to Government, Bombay, is appointed as a temporary measure to be Additional Assistant Director-General, Indian Medical Service, with effect from the date on which he assumes charge of his duties, until further orders.

MAJOR J. N. WALKER, M.R.C.P., I.M.S., is appointed to officiate as Professor of Medicine, King George's Medical College, Lucknow, from the 15th October, 1917, until further orders.

FIRST Class Senior Sub-Assistant Surgeon, ranking as Subadar, Sher Muhammad, *Khan Sahib Bahadur*, is granted the honorary rank of Assistant Surgeon with effect from the date of this notification.

THE following gentlemen have been appointed as temporary Civil Assistant Surgeons in Bombay Presidency with effect from the dates specified against their names :—

(1) Mr. Soira Manjunnath Kamat, M.B., B.S.—5th September, 1917.

(2) Mr. Yeshvant Jagannath Munkute, M.B., B.S.—8th September, 1917.

(3) Mr. Kewalram Tarasing Ramchandani, M.B., B.S.—18th September, 1917.

(4) Mr. S. H. Oomrigar, M.B., B.S.—27th September, 1917.

(5) Mr. Bhaskar Gangadhar Kelkar, M.B., B.S.—3rd October, 1917.

(6) Mr. Haridas Prabhudas Vaishnav, M.B., B.S.—12th October, 1917.

(7) Mr. Vasantrao Lakshmishankar Bakshi, M.B., B.S.—14th October, 1917.

THE following promotions are made, subject to His Majesty's approval :—

#### *Captains to be Majors, I.M.S.*

Dated 1st August, 1917.

Harry William Pierpoint, F.R.C.S.; William David Henderson Stevenson, M.D.; Henry Patullo Cook, M.B., F.R.C.S.E.; William James Fraser, M.B., F.R.C.S.E.; Charles Aubrey Godson; Reginald Henry Lee, M.B.; William Anderson Mearns, M.B., and William Barbour Alexander Kennedy Cullen, M.D.

The above eight officers belong to that batch of 1st February, 1906, and so have received 6 months' accelerated promotion. The batch consists of 23 names, apparently these have not yet been in a position to qualify for accelerated promotion.

FIRST Class Assistant Surgeon G. C. Kelly, Indian Subordinate Medical Department, Medical Officer in charge of the Political Agency, Koweit, is granted privilege leave for three and a half months, with effect from the 13th October, 1917.

Second Class Assistant Surgeon J. G. Johnstone, Indian Subordinate Medical Department, Quarantine Medical Officer, Lingah, on return from leave is posted temporarily as Medical Officer in charge, Political Agency, Koweit, with effect from the 13th October, 1917.

Second Class Assistant Surgeon A. L. Hudson, Indian Subordinate Medical Department, is appointed to officiate as Assistant Surgeon in sub-charge of the Residency Dispensary, Bushire, with effect from the 5th June, 1917, and until further orders.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified :—

Bhola Nath, 6th November 1917; Bantwal Rama Bhatji, 9th November, 1917.

CAPTIAN T. D. MURISON, I.M.S., Military Medical Officer, Meerut, to hold civil medical charge of the Meerut District, in addition to his military duties, *vice* Major J. S. O'Neill, I.M.S.

The *Gazette of India* of 4th December published the list of the recipients of Honours in the newly established "Most Excellent order of the British Empire," and we notice the following medical names :—

We may add that the name of Lieutenant-Colonel Jay Gould has already appeared on C. B. E. in the list issued at Home.

*Commander, British Empire.*

Surgeon Lieutenant-Colonel Sir W. R. Crooko-Lawless, Kt., C.I.E., of the Red Cross Hospital, Netley.

*Officer, British Empire.*

Lieutenant-Colonel T. H. Symons, I.M.S., of Hospital Ship *Madras*.

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters, and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 12, including postage, in India. Rs. 14, including postage abroad.

## BOOKS, REPORTS, &c., RECEIVED :—

Radiography, Vol. I. Robert Knox (Edinburgh Medical Series.) A. and C. Black, Ltd.  
China Medical Board (Rockefeller Foundation.)  
International Health Board (Rockefeller Foundation.)  
Freyberger's Practitioners' Pocket Pharmacology, Wm. Heinemann.  
H. C. Muldoon, Pharmacological Latin. London, Chapman & Hall, Ltd.  
M. Steel, Organic Chemistry. London, Chapman & Hall, Ltd.  
B. D. Basu's Diabetes, 8th Ed. The Panini Office, Allahabad.  
O. Leyton, Diabetes and Alimentary Rest. Price, 3s. Adlard & Sons, London.  
E. C. Younger's Insanity. Baillière, Tindall & Cox. 5s.  
Lamb. Throat, Ear and Nose. 4th Ed. Baillière, Tindall & Cox. Price 8s. 6d.  
Capt. C. W. Sewell's Hand and Finger Re-education. 6d. Baillière, Tindall & Cox.  
W. W. Keen's Treatment of War wounds. W. B. Saunders Co.  
The Atreya School of Medicine. B. C. Gupta, 44, Beadon St., Calcutta.  
Public Health Bulletins Nos. 83 and 84.  
Hygienic Laboratory Bulletins, 106, 107, 108, and 109.  
Uncinariasis in Siam.  
Diseases of the Skin. Sir Malcolm Morris, Cassell Co. 12s.  
Whitledge and Newman, Hygiene and Public Health. Cassell Co. 10s. 6d.  
Fuch's Textbook of Ophthalmology (New Ed.). J. B. Lippincott, Philadelphia.  
The British Journal of Surgery, Vol. V, No. 18. J. Wright & Sons, Bristol.

## LETTERS, COMMUNICATIONS, &c., RECEIVED FROM :—

Capt. Phillip Savago, I.M.S.; Col. Dennys, I.M.S., Shillong; Dr. R. Goheen, Venguela; Dr. Mallunah, Hyderabad; Major R. F. E. Austin, R.A.M.C., Calcutta; Col. Jennings, I.M.S., Poona; Maj. H. S. Matson, I.M.S., Poona; Dr. T. Hussain, Allahabad; Dr. Dodds Price, Nowgong; Dr. Spittel, Colombo; Dr. H. F. Lechmero Taylor, Jalalpur-Jattan; Capt. Kenneth Black, R.A.M.O., Bombay; Lieut.-Col. D. G. Crawford, I.M.S., England; Maj. E. O. Thurston, I.M.S., Katmandu; Dr. Chuni Lal Bose, Calcutta.

## Original Articles.

CHLORINATION OF DRINKING WATER  
SUPPLIES IN THE FIELD.

BY P. HEHIR, M.D., F.R.C.P., D.P.H., D.T.M.,

COLONEL, I.M.S.

THE first apparatus for the chlorination of drinking water in the field was devised by Captain Harper-Nelson, I.M.S., in January, 1915. This apparatus was originally made by Messrs. Kemp & Co., Chemists, Bombay. Every unit of the original 6th (Poona) Division was provided with a set.

The purifying effects of chlorine on waters of doubtful potability is now almost universally recognized and calls for no insistence at this late date. It is frequently found, however, that the instructions regarding the preparation of the concentrated chlorine water are not properly carried out, with the result that the reputation of the process suffers.

It may, therefore, be useful to publish these instructions with a specification of the apparatus; they are lucid and comprehensive and given almost *literatim et verbatim* in Captain Harper-Nelson's own words. The diagrams are likewise from his original sketches.

IMPROVISED CHLORINE APPARATUS FOR WATER  
STERILIZATION.

1. Large bottle A of capacity 24 oz. (not less). Mouth should be about one inch wide. On the side a mark should be made indicating 20 ozs. when filled up to its level with water (see diagram).

2. Small bottle B of a capacity of 1 oz. Mouth should be about three-quarter of an inch in diameter. On the side a mark should be made indicating 2 drachms (see diagram).

3. Stopper for A is perforated, and two pieces of glass tubing about 0.5 c.m. let in. One piece of tubing should be sufficiently long to reach almost to the bottom of the large bottle A. The other should be short, and just pass through stopper, projecting into bottle for half an inch (see diagram). Corks are best for this purpose for an improvised outfit, but extra ones should be supplied as they deteriorate and rot by the action of chlorine. If vulcanite tubing can be obtained it should be used instead of glass.

4. Stopper of small bottle B is perforated, and one piece of glass tubing passed through to project about half an inch inside bottle. Corks are

again used, and spare ones should be supplied. Substitute vulcanite for glass if available.

5. Bottle same size as A, and with 20 ozs. mark on it, for concentrated hydrochloric acid: In the event of bottle A getting broken this bottle could then be used in its place.

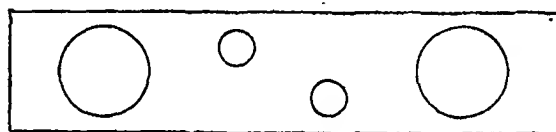
6. Small metal or vulcanite case to hold 350 five-grain potassium chlorate tabloids.

7. Small vulcanite or glass pestle and mortar to powder potassium chlorate tabloids.

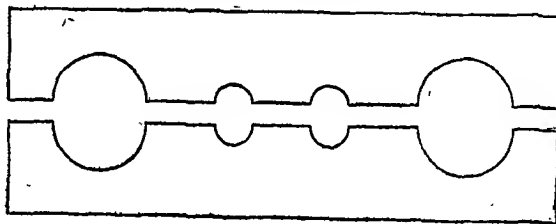
8. Half a yard of rubber tubing: Include on spare small bottle B.

This should be packed in a compact, strong, but light wooden case (see diagram). This gives a general idea of the complete outfit packed. The drawer is for spare corks, tubing, vulcanite, pestle and mortar and potassium chlorate box.

The bottles must be firmly packed. The bottom of the box should be of double thickness, and holes cut for the bottoms to accurately fit the bottles, thus:—

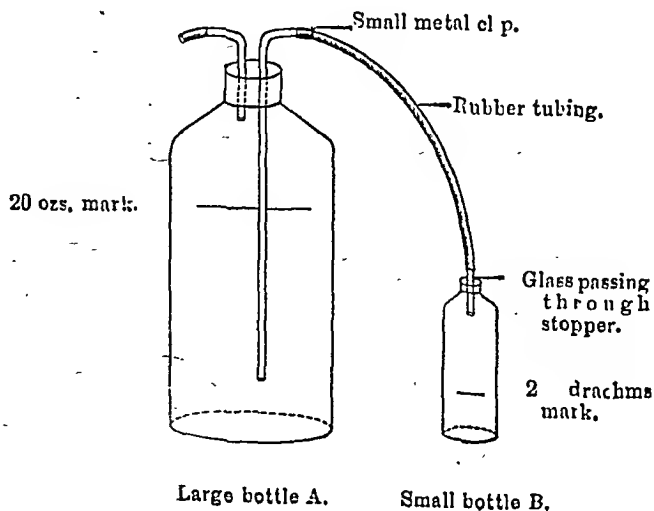


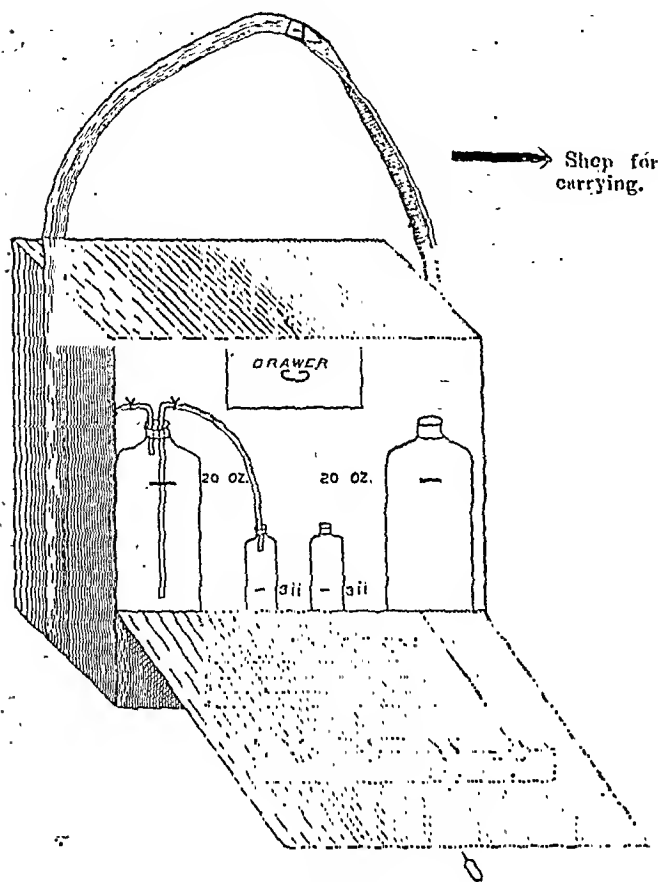
Higher up should be a rack in front and behind to grip the bottles, thus:—



(Felt lining to be put round places for bottles.)

The front rack is attached to lid, and opened with it, allowing bottles to be removed. Outfit fully loaded should not weigh more than 12 pounds.



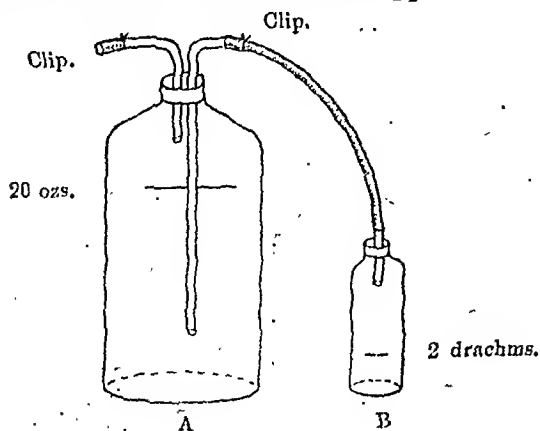


The whole to be compact. This is not drawn to any scale, and spacing between bottles is exaggerated. The two small bottles might be placed one in front of the other instead of side by side as shown.

#### INSTRUCTIONS.

1. Fill large bottle 'A' up to 20 oz. mark with water and insert stopper, tightly closing clip on short tube but leaving clip on connecting tube to small bottle open.

2. Place 2 drachms of concentrated hydrochloric acid in small bottle 'B.' Then take three five-grain tabloids of potassium chlorate, powder them and add powder to the acid in small bottle. At once insert stopper.



3. Shake small bottle, or heat gently, until all the powdered potassium chlorate is dissolved.

4. Unstopper both bottles and add contents of small bottle to the large one.

Chlorine water in large bottle is then ready for use.

#### STRENGTH.

One ounce to be added to five gallons of water and allow half an hour to elapse before drinking water treated, 2 ozs. to 10 gallons, etc.

The small bottle having a capacity of one ounce can be used as a measure.

(Note.—To be printed and affixed to lid of box.)

#### NOTE ON INTRAVENOUS INJECTIONS OF TARTAR EMETIC IN THE TREATMENT OF MALARIA.

By T. A. HUGHES,

GAPT., I.M.S.

THE observations here recorded were made in the spring of 1917 at an Indian hospital in German East Africa, and were suggested by Rogers' record of three cases of subtertian and two of benign tertian malaria in which he observed the disappearance of gametes from the peripheral blood following the intravenous administration of tartar emetic. The great majority of malarial cases admitted to the hospital were of subtertian infection, and the usual type of parasite found was the ring form. In fact only one case showing crescents was available during the period of observation. German records state that about 80 per cent. of the malaria in the districts from which the cases mostly came is subtertian, the remaining 20 per cent. being benign tertian with a sprinkling of quartan.

The cases, except three, were not chosen, some being severe and some slight. The exceptions were three cases of blackwater fever, which after the blackwater had disappeared developed fever with parasites in the peripheral blood. There being some doubt as to the advisability of administering quinine except in small doses to such cases, tartar emetic intravenously was tried. One case had a relapse of blackwater after an intramuscular injection of ten grains of quinine bi-hydrochloride. In all thirteen cases were treated, ten of subtertian, two of benign tertian, and one of quartan. Two of the subtertian cases and the quartan case were blackwater convalescents.

The drug was injected in 2 per cent. solution in normal saline by means of a 10 cc. syringe into a vein at the bend of the elbow, the quantities administered varying from 3 to 14 cgrms., given as a rule every second or third day. At first the smaller quantities were used beginning with 3 or 4 cgrms. and working up to 8, while in later cases 10 cgrms. was given as the initial dose and increased to 14 cgrms. With the latter dosage toxic symptoms manifested themselves, coughing and vomiting being sometimes troublesome. Care had to be taken that none of the solution escaped into the tissues surrounding the vein. This happened on two



occasions and gave rise to much local pain, and eventually in one case to suppuration. During the administration of tartar emetic all quinine was withheld, except in one case.

In general it may be stated specially with regard to subtertian infections that the disease was appreciably affected only when toxic doses (10 to 14 cgrms.) of the drug were given. Both cases of B. T. were thus treated, 10, 12 and 14 cgrms. and 10, 14 and 14 cgrms. (Table I) respectively being injected on alternate days. In these cases the treatment was at least temporarily effective, both cases being discharged to duty after a fortnight. Fever and parasites disappeared after the first dose, and no relapse occurred while the cases were under observation. The quartan parasites (rings and equatorial bands) were found in the blood of a patient (Table II) who was admitted on 23rd April, 1917, convalescent from blackwater fever. The urine was clear on admission on the evening of 27th, the temperature shot up with shivering to  $104^{\circ}6'$  F., and quartan parasites were found in the blood. Ten grains quinine bihydrochloride were given intramuscularly on 27th and 28th and the fever disappeared. Thereafter 20 grains quinine sulphate were given daily by the mouth, but on 8th May the temperature again rose to  $103^{\circ}2'$  and quartan parasites were found as before. An intramuscular injection of 10 grains quinine bihydrochloride was given on the morning of the 9th. That evening the patient developed blackwater with a temperature of  $105^{\circ}4'$ . Quinine was then stopped. On the 10th 8 cgrms. tartar emetic were given intravenously, the temperature came to normal, and the urine gradually cleared. Twelve cgrms. were given on 12th and 14 cgrms. on the 14th. The patient was observed until 29th May. He had no more fever and improved considerably in general condition. He was then transferred.

In two cases of subtertian (ring) infection, one a convalescent blackwater fever case, fever and parasites disappeared under the treatment and remained absent during the patient's stay in hospital, viz., 22 days (Table III), and 14 days, respectively, after the last malarial attack. One of these cases developed a sore arm with a temperature of  $99^{\circ}$  to  $99^{\circ}6'$  for three days, but no parasites were found; and the fever disappeared with improvement in the local condition. These cases received three large doses (12 to 14 cgrms.) each. Another case showing subtertian rings in the blood remained free from fever for 30 days after five injections of from 3 to 8 cgrms., but developed fever on the 30th day with ring parasites. The case showing crescents was available for observation for only three days and only one injection (10 cgrms.) was given. On the day of injection there was no temperature and crescents only were found in the blood. The following day fever developed with ring forms and

no crescents. Seven other cases of subtertian infection (rings) were treated with doses of from 3 to 8 or 10 cgrms. given at intervals of from 1 to 3 days, e. g., Table IV. In nearly all these cases the temperature was temporarily checked, and parasites either disappeared for a time or decreased in number, but in no case did any permanent good result. In one case enlargement of the spleen was unaffected by the treatment, but disappeared under subsequent quinine. A case of cerebral malaria with subtertian rings in the blood was given four injections of from 8 to 14 cgrms. in conjunction with intramuscular quinine, but without good result. It should be stated that, although no quinine was given except in the case just mentioned during the administration of tartar emetic, some patients had been under quinine treatment (orally and intramuscularly) before tartar emetic treatment had been begun.

As far as conclusions can be drawn from the few cases here mentioned, the results would tend to show that tartar emetic is not a cure for subtertian malaria, at least in non-toxic doses. Curative effects were observed in varying degrees only when doses toxic to the patient were given. This bears out Greig's statement that tartar emetic appears to be rather a general protoplasmic poison than a specific poison for the malarial parasite. The observations of Rogers on the influence of the drug on the sexual forms of malarial parasites have not so far been confirmed. Leboeuf and Low and Newham have not noticed any parasitocidal action of tartar emetic on crescents. Even should benign tertian and quartan parasites be amenable to large doses as the cases mentioned above might suggest, the facts that these parasites are vulnerable to quinine, that such doses of tartar emetic may provoke very unpleasant symptoms, and that severe local reactions result from accidental access of the solution to the perivascular tissues render tartar emetic an undesirable substitute for quinine in these infections, especially on a large scale.

The drug was also tried on two cases of African tick fever. They were given two doses of 10 and 12 cgrms. each intravenously on consecutive days during a pyrexial period. No effect was noted either on the general symptoms or on the spirochæte Duttoni.

I have to thank S. A. S. Nand Lal for valuable assistance in carrying out these observations.

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| * Low and Newham | B. M. J. 3rd March, 1917, p. 295.                            |
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\* Quoted in Bulletin de l'Institut Pasteur. No. 5, 1917, pp. 154-155.



TABLE I.

*Rama Sami, Railways.—Malaria B. T.*

| Dates.                  | Tartar emetic. | Parasites.              | Temp.    | Quinine. | REMARKS.            |
|-------------------------|----------------|-------------------------|----------|----------|---------------------|
| 21st April 1917         | ...            | B. T. asexual forms ... | 103.8° * | Nil.     | .....               |
| 22nd " "                | 10 cgrms.      | Neg.                    | Normal   | "        | .....               |
| 23rd " "                | ...            | .....                   | "        | "        | .....               |
| 24th " "                | 14 cgrms.      | .....                   | "        | "        | .....               |
| 25th " "                | ...            | .....                   | "        | "        | .....               |
| 26th " "                | 14 cgrms.      | .....                   | "        | "        | .....               |
| 27th " "                | ...            | .....                   | "        | "        | .....               |
| 28th " "                | ...            | .....                   | "        | "        | .....               |
| 29th " "                | ...            | .....                   | "        | "        | .....               |
| 30th " to 9th May 1917. | ...            | Neg.                    | "        | "        | Discharged to duty. |

\* In all tables the temperatures given are the highest in 24 hours.

TABLE II.

*Dhobi Moti Lal, 22, B. 1. C. H.—Blackwater Fever.*

| Dates.                 | Tartar emetic. | Parasites.                          | Temp.  | Quinine.                 | REMARKS.        |
|------------------------|----------------|-------------------------------------|--------|--------------------------|-----------------|
| 23rd April 1917        | ...            | .....                               | Normal | Nil                      | Urine clear.    |
| 24th " "               | ...            | .....                               | "      | "                        | "               |
| 25th " "               | ...            | .....                               | "      | "                        | "               |
| 26th " "               | ...            | .....                               | "      | "                        | "               |
| 27th " "               | ...            | Quartan rings and equatorial bands. | 104.6  | X grns. intramuscularly. | "               |
| 28th " "               | ...            | .....                               | 101    | "                        | "               |
| 29th " "               | ...            | .....                               | 100.6  | XX grns. orally          | "               |
| 30th " "               | ...            | .....                               | Normal | "                        | "               |
| 1st July 1917          | ...            | .....                               | .....  | .....                    | .....           |
| 8th " "                | ...            | Quartan rings and equatorial bands. | 103.2  | X grns. intramuscularly. | "               |
| 9th " "                | ...            | .....                               | 105.4  | Nil                      | Blackwater.     |
| 10th " "               | 8 cgrms.       | .....                               | 100    | "                        | Urine clearing. |
| 11th " "               | ...            | .....                               | Normal | "                        | Urine clear.    |
| 12th " "               | 12 cgrms.      | .....                               | "      | "                        | "               |
| 13th " "               | ...            | .....                               | "      | "                        | "               |
| 14th " "               | 12 cgrms.      | .....                               | "      | "                        | "               |
| 15th to 29th July 1917 | ...            | Neg.                                | "      | "                        | "               |

TABLE III.

*Sepoy Sher Mohamed, Baluchis.—M. T. Malaria.*

| Dates.                   | Tartar emetic. | Parasites.  | Temp.  | Quinine. | REMARKS.            |
|--------------------------|----------------|-------------|--------|----------|---------------------|
| 19th April 1917          | ...            | .....       | 101.2  | Nil      | .....               |
| 20th " "                 | ...            | M. T. rings | 102.2  | "        | .....               |
| 21st " "                 | 12 cgrms.      | .....       | Normal | "        | .....               |
| 22nd " "                 | ...            | .....       | "      | "        | .....               |
| 23rd " "                 | 12 cgrms.      | .....       | "      | "        | .....               |
| 24th " "                 | ...            | .....       | "      | "        | .....               |
| 25th " "                 | ...            | .....       | "      | "        | .....               |
| 26th " "                 | ...            | .....       | "      | "        | .....               |
| 27th " "                 | 14 cgrms.      | .....       | "      | "        | .....               |
| 28th " to 12th May 1917. | ...            | Neg.        | "      | "        | Discharged to duty. |

TABLE IV.

*Sepoy Indra Bir, Kashmir Rifles. M. T. Malaria.*

| Dates.                  | Tartar emetic. | Parasites.  | Temp.  | Quinine.                 | REMARKS.   |
|-------------------------|----------------|-------------|--------|--------------------------|------------|
| 1st March 1917          | ...            | M. T. rings | 103.2  | X grns. intramuscularly. | .....      |
| 2nd "                   | ...            | .....       | 102.6  | "                        | .....      |
| 3rd "                   | ...            | .....       | 99.4   | "                        | .....      |
| 4th "                   | ...            | .....       | 99.2   | XX grns. orally          | .....      |
| 5th "                   | 4 cgrms.       | .....       | Normal | Nil                      | .....      |
| 6th "                   | 6 cgrms.       | .....       | "      | "                        | .....      |
| 7th "                   | ...            | .....       | "      | "                        | .....      |
| 8th "                   | 8 cgrms.       | .....       | "      | "                        | .....      |
| 9th "                   | ...            | .....       | "      | "                        | .....      |
| 10th "                  | ...            | .....       | "      | "                        | .....      |
| 11th "                  | 8 cgrms.       | .....       | "      | "                        | .....      |
| 12th to 19th March 1917 | ...            | .....       | 101.4  | "                        | .....      |
| 20th March 1917         | ...            | .....       | Normal | "                        | .....      |
| 21st "                  | ...            | .....       | "      | "                        | .....      |
| 22nd "                  | ...            | .....       | 101.4  | "                        | Shivering. |
| 23rd "                  | ...            | M. T. rings | Normal | "                        | .....      |
| 24th "                  | 8 cgrms.       | .....       | 103    | "                        | .....      |
| 25th "                  | ...            | .....       | 102.2  | "                        | .....      |
| 26th "                  | 12 cgrms.      | .....       | 99.6   | XX grns. orally          | .....      |
| 27th "                  | ...            | .....       | Normal | "                        | .....      |
| 28th to 2nd April 1917  | ...            | .....       | "      | "                        | .....      |
| 3rd April 1917          | ...            | .....       | 10.4   | X grns. intramuscularly. | .....      |
| 4th "                   | ...            | M. T. rings | ...    | "                        | .....      |
| 5th "                   | ...            | .....       | 99.2   | "                        | .....      |
| 6th to 14th April 1917  | ...            | .....       | Normal | XX grns. orally per day. | .....      |

## QUININE IN MALARIAL PROPHYLAXIS.

By A. R. S. ANDERSON, B.A., M.B., C.M.Z.S.,

LT.-COL., I.M.S.

In commenting on a discussion on the position of malaria in sanitary administration, reported in the *Trans. of Soc. Tropical Medicine and Hygiene* (November 1916), the *Indian Medical Gazette* of last March attributes to Sir David Bruce a very pertinent demand for positive proof of the prophylactic value of quinine against malaria. So many of the senior medical officers in military employ share Sir David Bruce's scepticism, while so many of their contemporaries in civil employ held a contrary view, that I venture to submit the grounds on which my own profound distrust of the treatment is based.

One of my predecessors in office of S. M. O., Port Blair, a most experienced officer, warned me of the ill-success that had attended his long-continued endeavours to prevent malaria by the distribution of quinine both in the regiments in which he had served and among the convicts in Port Blair. But, as the female jail in Port Blair presented almost ideal conditions for testing the prophylactic value of quinine, I determined again to submit the question to proof. Accordingly, from May to September 1901, I placed half the inmates of the female jail on prophylactic quinine treatment, giving to each alternate woman in each barrack in the jail a dose of quinine mixture; half of those subjected to the treatment receiving 3 grains quinine daily, the

remaining half 4 grains daily. From October 1901 to February 1902 the dose to each woman treated prophylactically was increased to 20 grains on Saturday and 20 grains on Sunday; and, as a reward for their submission to the treatment, a half-holiday on Monday morning was granted to each woman so treated. But so unpopular was the treatment that the woman expressed their readiness to forego the half-holiday, if the administration of quinine were abandoned. In the annual report (written in March 1902) I noted that "not the slightest benefit was derived from the administration of 3 and 4 grains of quinine daily;" "while out of an average population of 390 (in the female jail) there has been an average monthly admission of 34 females suffering from malarial fever, and of these as nearly as possible half have been treated with a weekly dose of 40 grains quinine." The stay in hospital for fever occurring in those who had received 40 grains quinine weekly was slightly shorter than of those without prophylactic treatment in the proportion of about  $7\frac{1}{4}$  days in the former to about  $7\frac{1}{2}$  in the latter.

During my absence from Port Blair in 1902-03, the officer who officiated for me largely extended the prophylactic issue of quinine, distributing many hundred pounds of the drug to try and check the incidence of the disease. The result can best be seen from the subjoined figures referring to Port Blair culled from the annual reports of the Sanitary Commissioner with the Government of India, Table XLII.

*Intermittent and remittent fever-ratios  
per 1,000.*

|      |            |      |            |
|------|------------|------|------------|
| 1900 | ... 1184.2 | 1906 | ... 1454.4 |
| 1901 | ... 987.5  | 1907 | ... 1319.6 |
| 1902 | ... 1088.7 | 1908 | ... 866    |
| 1903 | ... 1107.3 | 1909 | ... 1129.2 |
| 1904 | ... 1181.5 | 1910 | ... 995.1  |
| 1905 | ... 1253.3 | 1911 | ... 680.4  |

In the annual report for 1911, which exhibits the lowest percentage for twelve years, mention is specifically made that no prophylactic issue of quinine was made during the year. There are, however, so many disturbing factors affecting the convict population of Port Blair, which in 1905 was nearly 15,000, that it would be quite unwarrantable to deduce from the figures quoted that the lower sick rate for 1911 was due only to a cessation of issue of prophylactic quinine.

In 1907 the Assistant Surgeon in medical charge of the Natore sub-jail, at my request, furnished me with a report on the result of issue of prophylactic quinine to the prisoners in the sub-jail. He wrote: "During the rainy season (June 15th to September 15th roughly) quinine was given to all persons on admission into the sub-jail for a week 15 grains daily; the result is eminently satisfactory." And in proof of his opinion submitted a statement showing the daily average population month by month of the sub-jail with the cases of malaria occurring month by month. In June, July, August and September the daily average population was 13.05, 6.02, 16.25 and 15.26, while the cases of malaria in the same months were 1, 4, 2 and 0. His statistics appear to me scarcely to justify his enthusiastic advocacy of his treatment.

In 1910 and 1911 I again performed an experiment like that I had made in Port Blair by giving to the prisoners housed in one of the pair of similarly placed barracks in Chittagong jail 15 grains quinine twice weekly, while the prisoners in the adjacent block were not treated. The quinine was issued between 15th June, 1910, and 15th November, 1910; and 1st July, 1911, and 15th November, 1911.

In 1910, during the above mentioned period, 10 cases of malaria occurred among those treated prophylactically, 16 among those without treatment, giving a percentage of incidence among the former of 1.75, while the percentage of incidence among the latter was 1.9, an inconsiderable gain in favour of those treated prophylactically.

In 1911 the corresponding figures were 5 and 6 among the prophylactic and non-prophylactic gangs, a percentage of 2.55 and 1.7 respectively. This year the gain was slightly in favour of the prisoners without treatment.

In both years it was quite impossible to keep the numbers in the two gangs even, but each gang numbered about one hundred.

In 1914 and 1915 a favourable opportunity again presented itself in the Dacca jail of testing the prophylactic value of quinine. At the opening of the jail, on each Saturday and Sunday, from the 17th July, 1914, to 5th January, 1915, and from 17th July, 1915, till the end of October, 1915, soon after which date my connection with the jail ceased, 10 grains of sulphate of quinine in solution were given to each A class prisoner. The B class prisoners remained without treatment. The average numbers in the classes were 796 in A and 438 in B class. The result of the treatment can be gathered from the following table:—

| Year and Months. | Actual number of cases occurring in |          | Percentage of cases occurring in A and B class to average population of their respective classes. |          |
|------------------|-------------------------------------|----------|---|----------|
|                  | A Class.                            | B Class. | A Class.  | B Class. |
| January 1914     | 6                                   | 4        | .80   | 1.00     |
| February 1914    | 5                                   | 4        | .66   | 1.07     |
| March 1914       | 8                                   | 3        | 1.02  | .77      |
| April 1914       | 6                                   | 3        | .75   | .73      |
| May 1914         | 6                                   | 4        | .78   | .92      |
| June 1914        | 8                                   | 1        | .96   | .22      |
| July 1914        | 10                                  | 5        | 1.20  | 1.12     |
| August 1914      | 10                                  | 1        | 1.17  | .22      |
| September 1914   | 13                                  | 4        | 1.57  | .87      |
| October 1914     | 12                                  | 2        | 1.50  | .42      |
| November 1914    | 6                                   | 2        | .76   | .42      |
| December 1914    | 11                                  | 5        | 1.45  | 1.01     |
| January 1915     | 7                                   | 5        | .96   | 1.09     |
| February 1915    | 5                                   | 4        | .67   | .89      |
| March 1915       | 12                                  | 5        | 1.54  | 1.05     |
| April 1915       | 7                                   | 5        | .90   | 1.02     |
| May 1915         | 5                                   | 9        | .69   | 1.88     |
| June 1915        | 16                                  | 4        | 2.26  | .83      |
| July 1915        | 6                                   | 4        | .83   | .74      |
| August 1915      | 5                                   | 4        | .68   | .71      |
| September 1915   | 4                                   | 4        | .58   | .67      |
| October 1915     | 46                                  | 20       | 6.68  | 3.15     |

In calculating the above percentages, the men in hospital, in the convalescent, infirm and post-dysenteric gangs are excluded.

The table shows that for nine months the percentage of malaria cases was less in A than in B class, while for thirteen months the reverse obtained. The evidence is consequently slightly adverse to the use of prophylactic quinine, in any case not in its favour.

I may be pardoned if, for the benefit of those unversed in penology, I explain that A class prisoners are those without previous conviction recorded against their names; B class convicts are those previously convicted. Disparity in the monthly percentages of malaria cases in A and B class might be due to the varying lengths of sentences inflicted on the members of the two classes of prisoners, as it is obvious that, if the jail be non-malarious, the group containing prisoners with the longest sentences should exhibit a lower percentage incidence of malaria than that including men with shorter

sentences. The latter are frequently admitted from highly malarious localities and suffering from repeated attacks of malaria, which gradually tend to abate in the healthy surroundings of their new home.

Analysis of the jail population for 1914, however, showed that the number of A and B class prisoners sentenced to various terms of imprisonment, from a few days to five years, was roughly in the same proportion as the total of each class, viz., about 2 of A to 1 of B. With over 5 years sentences there were about  $3\frac{1}{2}$  of A to 1 of B; but the numbers were relatively small, 92 A and 26 B, and such difference as there was tended to decrease the number of malaria cases among the A class to whom the prophylactic quinine was given:—

1. The above figures for malaria admissions are admittedly, not scientifically, accurate; each case was not investigated microscopically. But a similar degree of erroneous diagnosis may reasonably be attributed to both groups of cases—those treated prophylactically and those without treatment.

2. The figures given refer to total admissions only, but fail to show the actual number of prisoners affected with malaria, a number which is usually, though not necessarily, smaller than the number of admissions.

3. The figures fail to distinguish between malaria contracted during the time of the experiment and relapses due to previous infection. In Quetta, where infection for several months is impossible owing to the great cold in winter and consequent absence of anophies, I have seen relapses, accompanied by parasites in the blood, occur at least six months after the last possible exposure to infection. Further, on one of my outward voyages to India in the Gulf of Aden I examined the blood of a lady passenger suffering from slight fever. Only after half an hour's diligent search did I discover one quartan parasite. The lady assured me that seven years had elapsed since she contracted malaria in India, that she had been free from the disease since then and had resided in Europe for the previous three years. Relapses must then account for a considerable but uncertain number of the cases admitted at any given time.

On the other hand, the number of admissions fails to show the number of men infected with malaria, for patients with fairly numerous crescents in their bloods have expressed to me their desire to leave hospital and resume their duties as they felt fit for work. On one occasion even an English lady, in very easy circumstances, who consulted me about her chronic dysentery, mentioned incidentally that she occasionally suffered from slight fever accompanied by a little headache and malaise, though insufficient to interfere with her social activities. The

microscope revealed fairly numerous crescents in her blood. For the above reasons the figures quoted are no true index of the malaria contracted locally in the jails.

4. Owing to the occurrences of illness in the prophylactic and non-prophylactic groups, the necessity of treating such sick in hospital, of giving them treatment with large doses of quinine, if affected with malaria, and of subjecting such men to prolonged subsequent treatment in convalescent gangs, the size of the two groups varies rapidly, and when small, very misleading percentage figures result.

5. None with any experience can doubt the curative value of quinine when given in suitable doses, but the failure to prevent malaria, by the administration of so-called prophylactic doses, is apt to excite prejudice and distrust of one of our most certain and effective drugs.

6. In spite of the unavoidable imperfections of the statistics I have given, it is justifiable to infer that prophylactic doses of quinine, 3 or 4 grains daily, 10, 15 or 20 grains twice weekly or 15 grains oftener, probably exercise neither a beneficial nor a prejudicial effect, so far as concerns malaria infection, on those so treated.

7. If the above inference be conceded, then the statement on the slip of paper issued with the Government of Bengal quinine treatment, viz., "at the time of outbreak of fever at the locality it is beneficial for every one to take one pill daily," is unjustifiable.

8. The failure of quinine to prevent the occurrence of malaria is possibly due to the comparatively small doses in which alone it can be given to people who walk about and continue their duties. Cases like the following are of frequent occurrence. An Army Hospital Corps man contracted fever in Basra nine months previously, was granted leave, resumed duty in Quetta and was admitted to hospital for fever last January. After treatment with 30 grains of quinine in solution daily the fever abated and remained absent for five days. In spite of the continuance of the treatment it recurred and assumed the classical tertian type. Three weeks after commencement of the treatment ordinary tertian parasites were found in the blood. The dose of quinine was then raised to 40 grains daily, the fever forthwith abated and was absent for five days; a reduction of the dose to 30 grains daily coincided with a relapse lasting five days; increase to 40 grains at once caused a disappearance of the fever and a daily repetition of this same dose for nine days with a subsequent reduction of the dose to 30 grains for three days, followed by a gradual diminution of the daily dose to 20, 15 and 10 grains, caused a complete cure of the fever. Such large doses as 40 grains daily could not be given to working people both on account of the unpleasant physical effects of the drug, on

account of the expense, and, most important of all, the universal shortage of quinine that would inevitably result.

9. The waste of quinine on so-called prophylactic measures must inevitably raise the price of that drug and so check its legitimate and proven effective use as a curative agent.

10. The waste of funds on prophylactic quinine must be enormous, and, under present financial circumstances, demands very careful reconsideration.

## THE TREATMENT OF CEREBRO-SPINAL SYPHILIS BY MEANS OF SERO-ARSENOUS AND MERCURIC IODIDE.

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AND

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In presenting this subject, I lay no claim to any originality in the procedure of treatment, nor to any originality in the use of Arsenous and Mercuric Iodide.

In 1912 Swift and Ellis, of Rockefeller Institute of New York, first brought to the knowledge of the medical world the new and modern treatment of paresis and locomotor-ataxia by means of Sero Salvarsan, and in 1916 R. L. Spittal of Colombo published his article on the use of Arsenous and Mercuric Iodide in syphilis and yaws.

I have simply tried to make use of the Swift and Ellis treatment by substituting Arsenous and Mercuric Iodide in the place of Salvarsan. The prohibitive price of Salvarsan, or its newer substitutes, has made it nearly impossible to use this drug in treating the general run of hospital patients suffering from cerebro-spinal syphilis, and aside from the small or practically no benefit gained by the use of mercury, administered in the ordinary way, these patients leave us in little better condition than when they enter the hospital.

In Arsenous and Mercuric Iodide we have a combination of drugs which are in their effect, given over a period of time, quite equal to that of Salvarsan, and further the cost of which is quite in the realm of purchase for general routine hospital use.

Perhaps a review of the work of Swift and Ellis will not be out of place.

When Salvarsan was first introduced the hopes of medical men ran high as it was thought; we now had a panacea for all syphilitic diseases, including the most severe para-syphilitic forms of locomotor-ataxia and paresis. Attempts were then made to inject these patients in the usual subcutaneous, intramuscular, and intravenous methods with Salvarsan; in some cases there was

slight improvement, but in other cases none, and even some deaths occurred.

On examining the spinal fluid of these injected patients no arsenic was found, so, as far as the action of arsenic went, its value was negative. The next step was to inject Salvarsan directly into the spinal canal, but this proved too dangerous. Swift and Ellis then injected their patients intravenously, and later used the blood serum of the patient to inject into the spinal canal.

To get a clear idea of mediated action on cerebro-spinal system, we have to keep in mind the anatomy of this part of the body.

The cerebro-spinal fluid is secreted, as we know, by the choroid plexus into the lateral ventricles; the blood vessels of the meninges also probably help to secrete a certain amount. Passing through the foramen of Munro, the third ventricle and the aqueduct of Sylvius, it reaches the fourth ventricle and enters into the eistern-like sub-arachnoid spaces at the base of the brain by means of the foramen of Magendie and lateral cleft of the fourth ventricle; also part of the fluid reaches the same spaces by means of the clefts of the descending horns of the lateral ventricles. The major part of the fluid passes upward through the sub-arachnoid spaces along the convexity of the brain where the arachnoid covers the eisterna which is filled with the cerebro-spinal fluid. Interposed between the arachnoid and the pia mater, there is a spongy work of areolar connective tissue, the meshes of which are constantly bathed in cerebro-spinal fluid. This areolar tissue is again in connection with lymphatic tissue, and by this means the sub-arachnoid space is reached. The smaller part of the fluid passes downward and enters the vertebral canal through the sub-arachnoid spaces of the spinal arachnoid membrane; this spinal sub-arachnoid is a fairly large space and forms a sac around the cauda equina: by means of this fact we are able to puncture the spinal canal either to obtain the spinal fluid or to administer medication.

As to the features of the cerebro-spinal fluid, it is a clear colourless fluid varying in amount from 50 to 80 c.c., this amount depending upon the intracranial pressure. Its specific gravity varies between 1,005 and 1,007, which is lower than that of blood, which is 1,058 to 1,062. Of its more important constituents we find sero-albumen, globulin and albumoses; the latter two are found normally, while the former, the sero-albumen, is found only under exceptional conditions. The cellular elements consist of from five to ten cells per cubic millimeter, while polymorphonuclear cells are never present in normal fluid.

As previously stated, the specific gravity of spinal fluid is less than that of blood, but on the other hand the pressure of the cerebro-spinal fluid is greater than that of the intra-cerebro

venous pressure, hence the tendency of flow is from the cerebro-spinal system towards the venous system. Sicard demonstrated this fact by means of ink injected into the spinal canal at the lumbar region, and finding it later in the cerebro-arachnoid spaces.

In 1914, in New York, we were fortunate in securing a number of paretics and locomotor-ataxia patients whom we treated by means of the Swift and Ellis Sero-Salvarsan treatment. The results were striking especially in the locomotor-ataxia patients, all of which showed at the beginning a 3 or 4-plus Wassermann test of the spinal fluid. We considered a patient cured only when all the symptoms had disappeared and the Wassermann negative.

Here, as in many places in India, we have not the facilities which enable us to do the Wassermann reaction, so we have made use of the very simple test described by Gordon of Philadelphia in 1915. The test, as we use it, varies slightly from Gordon's original description. The test is as follows:—1 c.c. of blood serum is placed in the test tube. The serum should be free from hæmaglobin. Ten drops of a 1—100 solution of hydrarg. perchloride are dropped, by means of a pipette, slowly into the centre of the tube. The following phenomenon is observed:—

In the serum from a non-syphilitic patient the moment that the reagent comes in contact with the serum a white deposit appears which gradually increases in density until at the end of five to ten minutes the whole serum has assumed a thick whitish mass. At the end of twenty-four hours the condition of the mass will not be changed.

In the case of a syphilitic serum, when the reagent comes in contact with the serum, a slight deposit, or sometimes a foamy layer, forms at the top of the serum, the underlayer of the serum remaining clear. At the end of twenty-four hours the whole serum is found to be clear.

In case of the spinal fluid the reverse takes place. In a syphilitic spinal fluid, after the reagent has been added, a cloudiness is seen throughout the whole fluid which is milky in character and tends to increase in cloudiness during the twenty-four hours. In the case of the non-syphilitic spinal fluid the whole remains clear after adding the reagent. Only large doses of mercury seem to rob this test of its usefulness.

While we have not been able to compare our results of this test with the Wassermann reaction, it has seemed to justify its use as we have found it positive in nearly all cases presenting a clinical picture of syphilis.

The treatment as we are using it here is followed out in the same general way as Swift and Ellis first described it, only with certain variations made necessary, by using arsenous and mercuric iodide solution in place of salvarsan.

The solution of arsenous and mercuric iodide is made up in the following way:—

Mercuric iodide, gr. 60.

Arsenous iodide, gr. 87, 1/2.

Sodium iodide 1 per cent. solution, minims 35.

Distilled water to ozs. 40.

Using 20 minims of a 0.5 per cent. solution of phenolphthalein as an indicator, the whole solution is rendered slightly alkaline by carefully adding drops of a 25 per cent. solution of sodium hydrate as we near the neutralizing point which requires about two drams of the hydrate solution; we then proceed with care to add the sodium hydrate drop by drop until the solution has attained a distinct pink colour. This is the state of alkalinity which we desire. If the solution is rendered too alkaline, it forms a precipitate immediately or after a few hours or days. In this state the efficiency of the fluid is lost. Should the colour of the fluid fade away on keeping it, it means it has become too acid, in which case 15 per cent. solution of sodium hydrate should be added until the original pink colour returns. This solution will keep well for several weeks if placed in glass stoppered bottles under aseptic precautions, and it may be used for injection purposes without further reesterilization.

To avoid phlebitis the solution, just before injection, should be diluted; using a 20 c.c. syringe, the desired amount of the solution is drawn up, while the remainder of the syringe is filled with distilled water.

Signs of mercurism and iodism may appear at times, and, if so, within twenty-four hours; this may last for a few days, and in this case the next injection should not be given until these symptoms have subsided. Should marked intolerance to mercury and iodide exist, a smaller dose may be given.

The treatment consists first of administering weekly intravenous injections, beginning with doses of 8 or 12 c.c., and gradually increasing the dose each week until six doses are given with a maximum dose of 24 c.c. The doses are graded in the following way:—First week, 8 or 12 c.c.; second week, 15 c.c.; third week, 18 c.c.; fourth week, 20 c.c.; fifth week, 22 c.c.; and sixth week, 24 c.c. After the sixth dose has been given the patients are asked to remain in the hospital for the Sero treatment. This is begun within either 24 or 48 hours after the last injection, preferably after 48 hours. The first step is the withdrawal of blood from the patient, a vein of the arm generally being selected for this purpose, and anywhere from 30 to 40 c.c. is withdrawn into a sterile beaker or into a sterile centrifuge tube. If drawn into a beaker this is placed in a slanting position so that a greater fluid surface may be obtained, and not disturbed for twenty-four hours. If drawn into a centrifuge tube the blood is at once centrifugelized until the



serum is separated from the clot. The serum must be perfectly clear, having all traces of hæmaglobin removed. The next step is to inactivate the serum. This is done by placing the now clear serum in a sterile flask and putting the whole in a water bath which is kept at a temperature of 55 degrees centigrade for half an hour. This treatment of serum is supposed to destroy the lipid substances as well as the complement which is present in all serums. The serum is now diluted with sterile normal saline, the proportion being 40 per cent. of serum to 60 per cent. of saline. By this we endeavour to bring the specific gravity of the serum as near as possible to that of the cerebro-spinal fluid. The serum is now ready for injection.

As to the technique of the administration, there are one or two points to be carefully observed. The patient is allowed either to sit up or lie down. If the sitting posture is selected, the patient is brought well to the edge of the bed and made as comfortable as possible, the knees are well drawn up to the chest, the arms placed around the knees and the head well bent forward. If the lying down position is selected, which we prefer, the patient is again brought well to the side of the bed or table, the head is well bent forward and the thighs flexed upon the abdomen. A line is then drawn between the highest points of the crests of the ilia. This line carries us between the third and fourth lumbar vertebrae which is the point of selection in entering the cul-de-sac. This region is now sterilized by using either 4 per cent. or 6 per cent. iodine, and a cross is marked by the thumb nail at the point of inter-section of the iliac line with a vertical median line. The needle is now placed at the point of inter-section falling between the two vertebrae, and pushed directly forward. Just before entering the cul-de-sac a slight resistance is felt. The obturator of the needle is now removed and the spinal fluid obtained, unless a dry tap results, this probably being due to a blockage at the foramen of Magendie. Care must now be taken to draw off this spinal fluid very slowly, the pressure also being observed. Anywhere from 5 to 20 c.c. is withdrawn. We then use two 10 c.c. glass syringes or one 20 c.c. syringe of the Luer type. These are connected with the needle and 20 c.c. of the serum injected very slowly: the practice is to take at least twenty minutes or half an hour to inject the whole amount, never less than twenty minutes. After the treatment is completed the patient is made to rest quietly on his back for twenty-four hours or more and all his symptoms are watched carefully. The disturbance of inter-cranial pressure may cause a paralysis of respiration, and in this case artificial respiration must be resorted to at once. Fortunately this complication is not of frequent occurrence. Other minor complications may be chill, fever, and

headache. These, however, generally pass in twenty-four hours, the headache sometimes persisting for three or four days.

Our results by this treatment of cerebro-spinal syphilis have been more than encouraging; as by this method we are able to produce direct medication to the seat of the disease by the use of a diluted combination of drugs which are specific in their action towards the *spirochæta pallida*, and in addition to this we are also able to bring into use the patient's own anti-bodies previously formed in the blood.

In closing I might add that if one treatment by the above method does not cure the patient, the whole process may be repeated until finally a negative Wassermann reaction or Gordon test on the spinal fluid is obtained and all the symptoms have cleared up.

#### CASE No. 1.

Name—S. S. Age—35. Sex—Male. Occupation—Servant.

*Previous and present history.*—Three years previous to the time of entering the hospital patient had contracted a chancre, and a few months later developed secondary symptoms. At the time of entering the hospital he complained of severe pains in and around the stomach region; these pains had existed for a year and a half; at times they were constant, while at other times they would occur once or twice in a day.

He also had great difficulty in passing urine, having to go at times one or two days without urinating. There had also been a gradual loss of strength in the limbs necessitating the use of two sticks for support. He had been treated with country medicines.

*Habits.*—Negative.

*Physical examination.*—Argyle Robertson pupil present—Some atrophy of muscles of the legs.

Romberg's sign present.

Knee jerks decreased.

Ataxic gait with foot drag.

Gordon test on blood: negative.

Gordon test on spinal fluid: positive.

*Treatment.*—Five intravenous injections of arsenious and mercuric iodide solution. Blood withdrawn after fourth injection and serum given by intra-spinal method.

A fifth intravenous arsenious and mercuric iodide given before patient went home.

*Result.*—About a week after Sero treatment walking improved, foot drag disappeared, patient walking with feet under control. Could pass urine better and the general condition improved.

Patient left soon after and we were unable to continue treatment.

#### CASE No. 2.

Name—J. M. Age—25. Sex—Male. Occupation—Fitter.

*Previous and present history.*—Nine years ago patient had an attack of gonorrhœa, but did not know whether he developed a chancre at the same time or not. No history of secondary rashes.

A year before he entered the hospital the patient had noticed that while walking the right leg seemed to drag and was heavy, and three months later the same condition developed in the left leg. This condition had gradually grown worse, until finally he was hardly able to walk owing to the loss of control over his legs, which, as the patient described, would jerk, tremble, and fly in all directions.

At the time of entering the hospital the patient complained of pain all over the body with the exception of the right mammary region, and also had sensations of heat and cold and inability to walk.

*Habits*—Negative.

*Physical examination*.—Patient is unable to stand without support; on endeavouring to walk, legs are extremely spastic and uncontrollable.

Bomberg's sign present.

Eyes react to light and accommodation.

Knee jerks greatly exaggerated, throwing the whole legs into a spastic condition.

Nakinski present.

Ankle clonus present.

Gordon test on blood: negative.

Gordon test on spinal fluid: positive.

*Treatment*.—Six injections of arsenious and mercuric iodide solution given intravenously, also K. I. and mercury per mouth. At the end of this treatment no improvement shown. Serum treatment then given. No reaction from serum treatment. About a week after intra-spinous injection he showed improvement in walking, less spasm and knee jerks not so active as formerly. Two weeks after the injection patient was able to walk slowly without the aid of his sticks and showed general improvement.

CASE No. 3.

Name—G. M. Age—25. Sex—Male. Occupation—Policeman.

*Previous and present history*.—Seven years prior to entering the Miraj Hospital, patient developed a chancre on the penis and a secondary rash a few months later. He was treated at that time in the Satara Hospital with mercury and K. I.

At the time of entering the hospital the patient presented the following symptoms:—

He could speak only with difficulty, the speech being of a slurring character. The right hand and the right leg were paralysed, face also somewhat involved. The right hand could not be lifted and the patient was unable to write even his own name. He walked with great difficulty, the right foot dragging on the ground. He stated that these symptoms came on suddenly one day while rising from the ground, about ten months before entering the hospital.

*Family history*.—Negative.

*Physical examination*.—Eye reflexes normal.

Right wrist and right elbow jerk greatly exaggerated.

Right knee jerk greatly exaggerated.

Left knee jerk normal.

Ankle clonus and Bakinski present.

Gordon test spinal fluid: positive.

*Treatment*.—Six intravenous injections of arsenious and mercuric iodide and K. I. by mouth.

At the completing of this treatment speech somewhat improved and right hand could be raised with the assistance of the left.

The Sero treatment was then given; two or three hours after the intraspinal injection patient had a chill, fever and headache; the next day the fever and chill cleared up, but the headache persisted for four or five days. There was also a sense of giddiness on trying to sit up, but this also soon passed off. After the first course of treatment patient improved; his speech and his walking also much improved.

A second course of treatment consisting of five intravenous injections and one intra spinous was given. The reaction following the last intraspinal injection was a little more severe than that of the first. Besides chill and fever he had headache and giddiness lasting for about a week, and also salivation which lasted about five days. About a week later the walking was greatly improved, and a little later the patient was able to

extend the arm and raise it to its full extent above his head. Speech gradually became more clear. Soon after this the patient went home and was advised to continue the K. I. He now writes to us in his own hand and states that his walking is nearly normal, his speech is now clear, and he has returned to his old position in the Police force.

AN INDIAN CRECHE IN BANGALORE.

BY S. JAMKITARAJ, L.R.C.P. & S. (EDIN.), D.P.H.,

Bangalore.

THE above institution was opened by the Municipality on January 15th, 1913. Its inception was due to Mr. F. J. Richards, M.A., I.C.S., the then Municipal President. The crèche was one amongst other recommendations made by a committee of local medical men and women appointed to investigate into the question of the high infantile mortality prevailing here. It was given effect to last. The municipal authorities received much assistance in the matter of preliminaries from Dr. (Miss) A. G. Lillingston, Medical Superintendent of the Local Zenana Mission Hospital.

The initial expenses for the purchase of furniture and other sundry articles necessary amounted to about Rs. 200. A medium sized, upper-storied, rented building was selected close to a shun area in the heart of the town. It was proposed to limit the number of admissions to twenty infants only, the age-limit being fixed at 2 years, preference being given to much younger ones. Provision has now been made for 30, and the number of children coming in is from 20 to 25 at the most. The crèche is not worked on Sundays. The charge nurse resides at the premises. Her work is supervised by the Health Officer, the Divisional Sanitary Inspector, and for the past six months by the Lady Health Visitor in addition. (The latter appointment was recently sanctioned, a European qualified nurse being selected.)

The children admitted usually belong to the so-called "untouchable classes," namely, Panchamas, Madigas, Voddars and Indian Christians, although no caste restrictions or scruples are observed. Mahomedan babies are occasionally brought in, while no children from the caste-observing over communities are ever sent in.

The average daily admission works out to between 18 and 20. The highest number for a single day was 26. Some of the youngest tended at the crèche were about a week or two old, while twin babes have not been in frequent inmates. Ailing infants are not admitted, but advised to seek hospital relief and then brought in. It is interesting to note that not one casualty has occurred so far, excepting one case wherein a child was brought in a semi-starving and neglected condition by an unknown stranger (apparently the father) who

left it with the charge nurse, in spite of her refusal, saying he would return soon. This infant who was very ill was sent to the hospital, as the father never turned up, but unfortunately died.

The approximate charges incurred every month for maintenance are—

*A. Permanent—*

|                                       | Rs. | A. | P. |
|---------------------------------------|-----|----|----|
| (1) House rent ... ..                 | 15  | 0  | 0  |
| (2) Salary of charge nurse ... ..     | 30  | 0  | 0  |
| (3) Salaries of 2 ayahs at Rs. 8 each | 16  | 0  | 0  |
| (4) 1 peon ... ..                     | 7   | 0  | 0  |
|                                       | 68  | 0  | 0  |

*B. Recurring Expenses—*

These include dieting charges and sundries, averaging about Rs. 50 a month, total Rs. 118, i.e., approximately Rs. 120 per mensem. This should be considered reasonable.

The charge nurse is a diplomaed Indian Christian midwife and sick nurse and has worked very satisfactorily from the start, as will be seen from the extracts from the visitors' book (given later).

The following, briefly, is the daily routine:—

1. *Toilet.*—This consists in bathing the infants and clothing them with the crèche clothes.

2. *Diet.*—Babies under six months are fed on cows' milk, suitably diluted and sweetened. The older infants are given gruel made of finely screened ragi flour (specially made) with milk, a little water and sugar, light rice-cakes, boiled rice with vegetables, and bread; meat curry and broth are occasionally given.

NOTE.—Ragi is one of the chief staple food-grains used in parts of Southern India, especially Mysore State. It is a nourishing food-stuff. Aluminium vessels and English feeding bottles are used, and every care is taken to ensure these being kept clean.

The cradles are of the Indian basket and the swinging cloth patterns, commonly noticed in Southern India. Toys are also provided.

Infants above 3 months old found unvaccinated are vaccinated by the Municipal Vaccinator.

The following extracts from the Municipal administration reports may be of interest:—

1912-1913.—“An experimental day nursery, for which provision was made in the last Budget, was opened near Blackpally at No. 14, Cockburn Road by the President (Mr. A. R. Cox, I.C.S.), in the presence of Dr. (Miss) Lillingston and the Municipal officers on 15th January, 1913. The Municipal Commission wish to thank Dr. Lillingston for her help and advice in this matter. The number of children admitted as inmates every day is 18. They are fed and looked after from 7 A.M. to 9 P.M. while the mothers are away at work. Admission is confined to children under two years of age, and there is at present sufficient accommodation for about 20. The crèche is closed on Sundays. The charge nurse, assisted by 2 ayahs and one peon, has been working satisfactorily. The remarks of the several visitors interested in

the movement have been appreciative. Steps will be taken to start one or two more if the nursery proves successful and when funds permit.”

1913-1914.—“This which is in its second year of existence has been serving a very useful purpose, though admission is at present restricted to 20 children. The average number of children daily admitted has been 18. The age-limit has been reduced from 2 years to 18 months. The work of the midwives and the day-nursery are supervised as carefully as possible.”

1914-1915.—“The number of children up to 18 months old admitted was 5,652 giving an average of 18 per day. Surgeon-General Corker (Army Medical Service, Southern Army) and Colonel A. E. Tate, A.D.M.S., Bangalore, were amongst the visitors and appeared pleased with this institution. It is hoped to enlarge this in the near future to give it a wider scope.”

1915-1916.—“This institution which is still in an experimental stage maintained its popularity with the mothers of the poorer classes. It draws numerous visitors and all leave appreciative remarks in the visitors' book. Three mofussil gentlemen presented a few toys and clothes for use at the crèche which were gratefully acknowledged.”

1916-1917.—“The question of a permanent habitation and provision of greater accommodation has been deferred for the present. The work of the charge nurse and ayahs was supervised by the Lady Health Visitor. Major W. A. Justice, I.M.S., Sanitary Commissioner, Madras, visited this nursery and made the following remarks (*vide* page 53)

\* \* \* \*

It is high time that more institutions of this sort are founded by charitably disposed citizens.”

A few select remarks from the visitors' book will not be out of place here—

Dr. Amritaraj brought Colonel Tate and myself to see the crèche. To me it seems a wonderful development of modern ideas. It is said to be greatly appreciated. Everything seems very clean. Milk good, aluminium vessels.

(Sd.) T. M. CORKER,

SURGEON-GENERAL,

7th July, 1914.

Southern Army.

I visited and was greatly interested in this crèche. Everything was most clean, and it appears to me to be a most useful form of charity. Perhaps later small payments might be taken from those who can afford it.

(Sd.) C. BRODRIBB, M.B., B.S.,

CAPT., I.M.S.,

20th July, 1914. Staff Surgeon, Secunderabad.

This is a great tribute to the thoughtful kindness of the Municipality.

(Sd.) H. E. SHORT,  
*Belmont, Brisbane, Australia.*

I am very pleased to have visited this excellent institution. During the 3 years that it has been working it has apparently done a lot of good to the poor workers. I wish that a similar institution may be founded for the use of caste Hindus.

(Sd.) M. SREENIVASA ROW,  
M.A., M.D., D.P.H., Etc.,  
*Deputy Sanitary  
Commissioner, Mysore.*  
28th April, 1916.

It has given me a great pleasure to see the crèche and its little inmates who are being fed and carefully looked after when their mothers are away; the place is a very sanitary one and well ventilated. I am quite sure that such a charitable establishment reflects the greatest credit on all the organisers and supporters of this institution. Indeed such sort of maintenance deserves all praise and appreciation.

(Sd.) S. HEM SINGH,  
SUBADAR-MAJOR (Retd.).  
8th July, 1916.

I consider institutions like this crèche should be established in all towns—the cost is small compared to the purpose they fulfil. I found the children well cared for and properly fed. The institution must be a great boon to mothers who have to spend the day at work.

(Sd.) A. JUSTICE, MAJOR, I.M.S.,  
*Sanitary Commissioner for Madras.*  
1st September, 1916.

*Closing Remarks.*—This institution now completing nearly 5 years of its existence can be regarded as a success, though it is still small. As one in immediate charge of it ever since it was begun, the writer feels bold enough to say it has been so far popular and done some good, though it does not (and cannot) touch the vast majority of the poorer infants in this station (Census total population of 1911—100,834). For want of funds, especially just now owing to war conditions, it could not be made larger. In a town of the size of this station (i.e., Bangalore) with its large working population there is need for not one crèche but for half-a-dozen at least, so that facilities may be available to deal with about 100 infants.

Municipalities by themselves cannot be expected to maintain these. Private philanthropy and social reformers should come forward to

assist and co-operate with municipal bodies. Institutions like this could be easily adapted to suit different castes, provided funds and other means of active support are forthcoming.

### TOBACCO FLEAS AND PLAGUE.

By S. MALLANAH,  
*Hyderabad, Deccan.*

It is a great mistake to attempt the suppression of epidemics according to a general scheme. Every disease has to be handled according to its own special individuality, and the measures to be taken against it must be accurately adapted to its special mode of causation. In combating disease we must strike at the root of the evil and not waste energy and money on subsidiary and ineffective measures.

For instance, in the case of cholera water is the main thing to be considered, in the case of typhoid the secretions and excretions have to be dealt with, and in case of hydrophobia compulsory muzzling of dogs is the only rational method to be undertaken. So in the case of plague the destruction of fleas should be the chief measure to be thought of. Though plague is a disease of rats, it is only through the agency of fleas that the disease is communicated from rat to rat, from rat to man, from man to man and from man back to the rat. So in my opinion the destruction of fleas should be our chief aim. It is now well recognised that in plague the infection does not reside on the floor, walls or roofs of houses, not in the atmosphere but in the bodies of rats and fleas. This being the case, a disinfectant cannot be expected to be of any use since it cannot come in contact with the infectious matter in the bodies of rats and fleas and therefore cannot destroy it. It is true that disinfectants are of great value in consumption, in typhoid fever and in cholera, but they are of no use in plague for the reason explained.

Now, tobacco does not destroy the "Bacillus Pestis." It is not a germicide, neither is it a disinfectant in the ordinary sense of the term; but by destroying the flea, which is a carrier of infection, it acts as a disinfectant indirectly. All the pulicides so far discovered have been found infective in preventing reinfection of rooms once disinfected, because their action is transitory. Tobacco on the contrary retains its effectiveness, and therefore surpasses all others not only in this respect but in many others, as I shall presently show. Being convinced of its wonderful efficacy on fleas, I suggested the suppression of plague by its means to His Highness' Government after careful consideration and experiment.

The following facts are worthy of note:—  
(1) Tobacco kills fleas practically instantaneously.

(2) Being a diffusable drug, its action is effective even at a distance of six inches.

(3) Its action is permanent and continuous. Tobacco when spread on floors of houses will not only destroy fleas present at the time, but will go on destroying whatever fleas come later on to reinfect the house. Hence its action as a disinfectant goes on day and night as long as tobacco is kept spread out on floors.

(4) Its substance is not used up in destroying fleas, hence it can be used over and over again.

(5) It does not damp or mess the floors of houses.

(6) As it is used in a dry state no caste or creed can reasonably object to its use.

(7) It is a common and a cheap article.

(8) Now, for the first time, it is being pointed out that plague-infected houses can be disinfected thoroughly by this method, though such disinfection is of no use for any other disease except kala-azar, which is a very fatal endemic disease said to be communicated by bugs. In case of the latter, however, infusion of tobacco would be preferable.

(9) Reinfection of houses can be prevented as long as tobacco is kept in the house.

(10) Above all this drug can be used as a preventive measure which will stamp out plague.

I would like to mention here that I do not expect the wholesale destruction of fleas, which is not possible even if desirable. What I advocate is this—that people should be protected from being bitten by fleas.

This is quite possible. For fleas, as we all know, are found on the bodies of rats, in rat holes and in the usual haunts of rats, and that it is only after the death of rats that fleas leave their hosts and haunts in search of blood and after entering the interior of rooms attack human beings. Hence, if tobacco leaves are spread over the floors of houses where people sleep, the fleas as they enter the rooms will perish and there will be no infection.

In order to carry out this idea I suggested a new line of experiment which I was able to carry out in the City of Hyderabad solely on account of the support given by Nawab Fakhrul-Mulk Bahadur and Mr. Glancy who took a keen interest in this matter and to whom I am much indebted.

As it took a long time to spread tobacco leaves on floors of houses, and as it was found difficult for the people to keep them in place, it was arranged that tobacco leaves (well spread out) should be stitched on to a piece of cloth like a strip of matting and then laid on the floor. This is one of the reasons why the cost of tobaccoing houses came higher than I had anticipated. Another reason was that the majority of houses selected belonged to a better class of people, like clerks, managers, and

merchants who had more than three rooms to live in and hence larger floor space to sleep on. On average it costs Rs. 2-9 for "tobaccoing" a single roomed house (9ft. x 9 ft.); this includes the cost of tobacco, cloth, and stitching. One square foot requires about one leaf of tobacco and costs about 2 pies. Tobacco without cloth-lining was used in three houses, and the cost for a room 9ft. x 9ft. came to 12 annas only. On an average about 105½ leaves are necessary, the cost of which comes to about Re. 1 per house. Sprinkling water on tobacco once a day keeps tobacco from crumbling to pieces and makes it more effective.

Powdered tobacco should be introduced into rat holes which can then be firmly closed up with brick and mortar.

Altogether 52 houses in highly infected areas were tobaccoed according to my method, 48 by the municipality and 4 by the police. Also 52 houses of the same type and in close proximity were left untouched as "controls." In some of the many-roomed houses where more than one family lived I took an opportunity of laying tobacco in one or two rooms and leaving another room untouched. This is shown in tabulated form marked I. The owners of some houses refused to continue the experiment after using the tobacco for a few days. In about quarter of these houses tobacco was removed. In one of such houses (No. 1389/1 situated in Kamela Khadeem) a case of plague occurred, which is one of the two reported. On inquiry Mr. Tajamul Hussain, a silver merchant who is the head of the family, informed me that tobacco was used only for three days. In this instance plague occurred on the 11th day after the removal of tobacco. As the house was tobaccoed on 27th January, 1917, and plague occurred on 9th February, 1917, it is quite clear that the house was practically a non-tobaccoed house when the girl got infected. It was not quite clear at first why the tobacco was used only for three days, but on further inquiry it was found that the girl had an attack of cough a day or two after the use of tobacco, and as the Hakem who attended her objected to the use of tobacco, it was removed.

The second case of plague in a tobaccoed house occurred in house No. 2729 in Mogulpura. I shall go over the case fully as it is an instructive one. There is no doubt that the house was tobaccoed and the tobacco was kept up until the end. It is also a fact that two cases of plague occurred in the house. The tobacco method seems to have failed in this case, but the failure was not due to the inefficacy of tobacco; on the contrary it was due to the insufficient quantity used through the negligence of subordinates in carrying out the instructions given. All the houses in which the experiment was made were tobaccoed in my presence, and I took down notes at the time of



tobaccoing. In the house in which the second case occurred the tobacco was not sufficient when I put it, and therefore a subordinate was instructed to put some more tobacco the next day, but this was never done. A rough sketch marked II will explain exactly what I mean. In the place marked A three persons named Mohammed Hussain, his wife and Ahmedbi used to sleep; this is the room in which tobacco was partly spread. It is deficient on the side where the provision room is situated. In the place marked B two persons named Amir Ali and his wife used to sleep. This portion was not tobaccoed and was left as "control." The provision room marked C communicates with A and B. In the place marked B Amir Ali got ill first. So the infection started there and then spread to the place marked A where Mrs. Hussain got ill. Both these persons died of plague. It is clear from the diagram that the fleas could easily pass through the gap into the place marked A. The gap unfortunately was next to the source of infection. If the tobacco had been spread properly I am sure the infection would not have occurred. However, I take this case as one where tobacco failed, and I have explained the reason why it failed.

Now I come to "control" houses: The first control house where plague occurred was No. 1322 in Kemala Khadeem. The second was No. 2450, Balmukand Lane, where four houses were tobaccoed with the help of the police. The third case in control is very interesting. It was reported that a case of plague occurred in a tobaccoed house No. 3615 in Maikalbunda. I found on investigation that plague had occurred in a control room and not in a tobaccoed room. The success of tobacco in this house is remarkable and conclusive, as a family in one part of the house not tobaccoed got infected, whereas the two families living in the same house but in tobaccoed rooms remained free from infection. The fourth case occurred in house No. 2729 situated in Mogalpura, already described. The fifth case occurred in control house No. 1158 in Philkhana. The sixth in a house without number in Imlibund (behind house No. 5848). The seventh case in house No. 1125 Fatheh Darwaza. This makes in all seven control houses which were infected with plague. Thus I am glad to be able to report that out of 52 houses which were tobaccoed, only one house got infected (though not through the fault of tobacco), and that out of the 52 "control" houses seven got infected, which shows that the tobacco failed (apparently) in 14.2 per cent. of cases and succeeded in preventing plague in 85.8 per cent. of cases experimented. The number of infected houses among the "control" houses seems a small one at first sight, but this is exactly what one

could expect under the circumstances as shown in table marked III.

It is a well known matter of observation that only a small number of houses and not all in a given locality get infected when plague breaks out, and that this number varies in different epidemics. For instance, during the present epidemic in the Residency bazaars where there are 2,216 houses only 226 houses were infected, which gives a percentage of 10. In the city, where I have carried out these experiments in Yacootpura, Mogalpura and Hussainialum, out of 2,866 houses, only 358 houses were found infected, which gives a percentage of 12.5. Out of 52 control houses 7 got infected, which gives a percentage of 13.4. Thus it is clear that the number of houses infected in the control is exactly what would be expected to take place under the circumstances.

Another method of testing the efficacy of tobacco on fleas was conducted in infected lines of 2nd Lancers, Golconda. Two sets of experiments were conducted; each set was made up of two experiments. In the first set two recently infected houses that were evacuated were selected, and a guinea-pig was introduced in each. After the death of the animal from plague the room was tobaccoed for four days and another guinea-pig was put in. In the second set two recently infected houses that were evacuated were tobaccoed for four days and then a guinea-pig was kept in each house after the removal of tobacco. These animals were left free to roam about and were supplied with grass, gram and water daily. None of the animals died of plague after tobaccoing the rooms. On account of the cessation of the epidemic I was not able to carry out more experiments, but the results of these few experiments lead to the same conclusion as the results of the experiments in the 52 houses referred to above, and confirm the opinion that tobacco destroys infected rat fleas and also prevents infection.

The Bombay Government spends 2 lakhs of rupees on plague per annum, of which Rs. 50,000 are spent for the treatment of the sick, Rs. 29,000 for disinfection, Rs. 28,000 for evacuation, Rs. 24,500 for improving insanitary dwellings, Rs. 19,000 for rat destruction and Rs. 500 for inoculation.

During the last epidemic the Hyderabad Government spent Hali Sikka Rs. 98,000 on plague, of which Rs. 39,000 were spent on evacuation, Rs. 18,000 on inoculation, Rs. 3,000 on disinfection and Rs. 757 on rat destruction. This shows that Bombay thinks disinfection and evacuation more important than inoculation, whereas Hyderabad gives preference to inoculation and thinks evacuation and disinfection more important than rat destruction.

It is seen from the Hyderabad figures that most of the money (and energy) has been spent on evacuation during the last epidemic. During the present epidemic more than three lakhs of rupees have been spent on this measure alone. Evacuation is a measure which is very effective, I admit, in villages and small towns, but useless and on the whole impracticable in large cities like Hyderabad. What was the result of this measure during the present epidemic? The disease spreads widely in all directions, and not only the villages and towns around Hyderabad got infected but the disease penetrated deeply (perhaps permanently) into the districts as well. So we shall have for the future as a result of evacuation numerous and widely spread centres of infection. It was unfortunate that even the camps did not escape infection. During the last epidemic Rs. 3,000 were spent on disinfection. This measure is known to be useless, and yet it has been carried out religiously notwithstanding its inefficacy. So far no measure has been suggested which serves two purposes at the same time as mine does, for the method suggested can be used both for purposes of disinfection and prevention. In conclusion, I firmly believe that if the Government spends even one-eighth of what it has actually spent during the present epidemic in carrying out my method, it will save the misery and the devastation of thousands of homes caused by the appalling death-rate from this calamity.

**NOTE.**—I have examined 15 tobacco shops and have found on investigation that most of the owners do not use the storage room as a sleeping room. Rats are generally not found in such rooms, as there is no food in such rooms for them. Rats however have been found in adjoining rooms where provisions are kept and cooking is done, and there are one or two instances where rats were found dead in such places. In the majority of tobacco shops plague did not occur; but the storing of tobacco is quite a different thing to the spreading of tobacco in sleeping rooms in the manner I have explained, which is never done by the tobaccoists. As tobacco has no action whatever on the plague bacillus, people habituated to tobacco-smoking or to chewing tobacco are not immune from plague.

## A Mirror of Hospital Practice.

### MEDICAL AND SURGICAL NOTES (LONDON MISSION HOSPITAL).

BY DR. T. T. THOMSON, M.B. (EDIN.), AND ARCHD. J. BENNIE, M.B. (EDIN.).

**General Statement.**—We are glad to report a year of progress in all respects. On November 7th the Hon. W. B. Bannerman, C.S.I., Surgeon-General to the Madras Government, opened our new Ophthalmic Wing with its Male and Female Wards, Operation, Sterilising and Dark Rooms.

**Special Notes.**—Although in Janmalamadugn itself there is little fever and anopheles culicifacies is exceedingly rare, yet we are constantly having to treat cases which bring us into direct contact with the disease and its after effects. A large number of cases were treated

during the year for acute enlargement of the spleen due to malaria, and in all cases we found the enlargement to subside under treatment with spleen mixture. In the acute attacks of malaria we were greatly pleased with the very good and rapid results obtained by hypodermic injection of quinine. In most cases a dose of six grains tended to stop the fever when very often the patient received no benefit from quinine by the mouth. The majority of cases admitted, however, have been of the chronic type, with cirrhosis of liver and ague cake with ascites. Frequently paracentesis was performed, but in most cases return of the ascitic fluid was rapid.

In one case in which the fluid collected within 24 hours after withdrawal, the patient being young, we performed omentopexy, with favourable improvement in his condition. The histories given show that a certain part of the district is infected with all types of the disease—quartan, tertian and quotidian.

**Diabetes.**—We are very often brought face to face with cases of diabetes and glycosuria, in most cases the patients being about middle age. The patients improved greatly on being placed upon ragi diet instead of rice, and on being given codeia and arsenic internally. Several were admitted with carbuncle complicating diabetes.

**Dysentery.**—A large number of cases of dysentery were treated during the year with success. Most cases were benefitted by treatment with large doses of Ipecacuanha. When this treatment failed, we were always able to succeed in stopping the diarrhoea and blood by injection of emetine. We have found this drug most reliable in the treatment of many cases of dysentery.

**Pulmonary Tuberculosis.**—This is very common in Janmalamadugn district and the surrounding parts. Cases were being constantly brought in an emaciated and weak state. Phthisis with cavity formation is common, but we have not seen many cases of the fibroid type of the disease.

Several cases were treated for sub-acute bronchopneumonic type of the disease. We have found open air treatment to be of great value in helping to diminish the temperature and sweating in these cases, and in improving the general condition of the patient.

**Skin Diseases.**—One case of favus was admitted during the year, whilst many cases were treated for psoriasis and seborrhoea.

#### ALIMENTARY SYSTEM

**Pyloric Obstruction.**—Several cases of chronic pyloric obstruction with marked dilatation and peristaltic movements of the stomach, associated with pain and vomiting, were greatly relieved by lavage; in fact a few cases which had been admitted and were being prepared by lavage for gastro-enterostomy were feeling so much relieved that they refused operation. One case having consented, Gastro-jjunostomy (posterior) was performed, and the patient showed great improvement and was relieved of pain and other symptoms. He returned three months later quite well and much stronger.

**Intestinal Obstruction.**—Amongst the cases of intestinal obstruction treated during the year there were a large number of varying degrees of severity, most of which were relieved by ordinary soap and water or oil enemata. Several cases, however, which were not relieved by such treatment, refused operation. One of the commonest causes of acute obstruction in this part of the country is the new cholam seed, which swells to a considerable degree in the patient's intestines. This type of obstruction is frequently fatal as a result of perforation, as the patients refuse operation.

One case of rather acute obstruction proved fatal within 24 hours after operation. The patient complained of symptoms of acute obstruction, which dated back to 13 days before admission. On admission to the hospital he had marked faecal vomiting, distention of the abdomen, and have not passed any motions for 13 days. He was given two ozs. of oleum

recini per rectum and santonin per mouth, with good results within ten minutes. This was followed by turpentine enema, also with good result, and great improvement in the patient's distention of abdomen and pulse. The patient was given food on the second morning after admission, and in the afternoon distention with ladder pattern and vomiting returned. Operation decided upon. At the operation there was found a marked twist of the mesentery of the small intestine upon itself, producing volvulus. The twist was relieved, the patient sent back to bed, but died in the early morning. At the *post mortem* everything was found to be in a healthy condition; affected bowel being shiny and of normal colour. As nothing was found to be abnormal, we presume that the patient died of toxic absorption.

**Appendicitis.**—Among the cases of appendicitis treated during the year, two cases are worthy of short notice. The first case was one of acute gangrenous appendicitis, whose history dated back as far as four years previous to admission. The patient suffered from more or less sub-acute attacks in the meantime. The last attack, which was exceedingly acute, began on March 3rd, 1913, and nothing was able to relieve the patient. On admission the patient was lying on his back with knees flexed, groaning with pain, face pinched and anxious, pulse rapid and feeble; the region of the appendix was tender, did not move with respiration and showed swelling. At the operation it was found that the appendix and adjacent portion of the cæcum were gangrenous, and cut off from the general abdominal cavity by adhesions. The abscess cavity was opened and drained. No attempt was made to remove the appendix for fear of infecting the general peritoneal cavity. The patient recovered.

The second case was one which, on admission, was suffering from general peritonitis (acute). The patient was too ill for a general anæsthetic. He had a quick thready pulse, pinched anxious face, and distended abdomen, which did not move with respiration; in fact, patient showed signs of very marked intoxication and acute peritonitis. It was decided to open the abdomen under local anæsthesia. Cocaine being used this was done and the patient's abdomen drained. He did not feel any pain during the operation, but died of toxic absorption five hours after admission.

**Laparotomy.**—Laparotomy was performed on several occasions for tuberculosis of the abdomen, and in each case there was marked improvement in the general health of the patient.

Two cases of ovarian tumour were found on laparotomy to have undergone malignant degeneration with extensive spread of the disease to the peritoneum. Further interference was impossible. The one ovarian tumour removed during the year was successful.

Abdominal hysterectomy was performed once for uterine fibroid, with good results. There were several cases of impacted fibroids with adhesions, which were found on laparotomy to be inoperable.

**Utero-Abdominal Fistula.**—One case with this condition was treated during the year. She proved to be a patient who had five years previously been operated upon for prolapse of uterus, the uterus having been fixed to anterior abdominal wall (ventrofixation). She remained healthy for two years after the operation, and then began to suffer from pain at the menstrual period. This continued until six months before admission, when an abscess appeared in the middle line of the abdomen, below the umbilicus, which, having burst, left a fistula from which blood escaped at each menstrual period. At the operation it was found that there was a fistula leading into the uterus, and shut off from the general peritoneal cavity by adhesions. Connected with the above there was a sinus leading into the connective tissue at the posterior aspect of the pubic bone. The edges of the opening into the uterus were pared and the opening sutured up with catgut, the sinus, etc., being well drained. The patient healed up and returned home cured.

**Hernia.**—One of the most interesting cases treated during the year was that of a young girl who came

suffering from right-sided femoral hernia associated with obstruction of bowels and retention of urine. On admission there was prominent distention of the abdomen in the middle line below the umbilicus, which was separated by a constricted portion, with another distention in the right renal region; both distentions were dull on percussion, and both subsided on the passage of the catheter.

**Operation:** On operation it was found that a portion of the omentum was herniated into the hernial sac. The bladder was found adherent to the neck of the sac; a portion of the bladder was pulled into the wound after dissecting off the adherent portion. It was found that the bladder was divided into two cavities by a constriction. The bladder was returned to the abdomen, and the sac, etc., dealt with as usual. The patient's wound healed by first intention. About a week following the above operation another swelling appeared in the left femoral region, which, on operation, proved to be a hernia of the left ovary. This was returned to the abdomen and the sac removed.

Two cases of strangulated hernia (Inguinal) were cured by radical treatment.

**Tumours.**—The following is a list of the main varieties of tumours treated with their sites:—

| TUMOURS.                            | SITES.   |
|-------------------------------------|--|
| <i>Epitheliomata</i> ...            | Cheek, lower jaw, tongue, upper jaw, penis, cesophagus.              |
| <i>Scirrhus Cancer</i> ...          | Breast, stomach.   |
| <i>Sarcomata</i> ...                | Testicle, upper and lower jaw, neck thyroid gland, large toe, femur. |
| <i>Osteo-Chondro Fibroide-noma</i>  | Parotid.   |
| <i>Osteo-Chondro Adeno-Sarcoma.</i> | Scapula.   |
| <i>Fibro-Sarcoma</i> ...            | Coccyx.  |
| <i>Adenoma</i> ...                  | Breast.  |
| <i>Fibroid</i> ...                  | Ear.   |

We are very sorry to state that most of the cases of carcinoma of the jaw treated or seen here were in a very advanced stage. There is invariably a history of some chronic irritation of the cheek or mouth by lime, which is usually mixed by the patients with betel leaves and chewed with the areca nut. There was one case of malignant degeneration of a thyroid cyst with a marked revolut of the adjacent glands. This was removed together with the glands and about two inches of the internal jugular vein, which was very adherent and could not be separated from the mass. The tumour was also adherent to the trachea. Patient recovered without delay. We have not seen her again so far, and hope everything was removed.

A large fibro-sarcoma was removed, together with the Coccyx in a child of one year and nine months of age. The result was favourable.

**Of Mastoid Operations** performed, all proved successful.

**Gastro-Jejunostomy.**—One case of gastro-jejunosomy (posterior) was a great success, the patient returning to report himself three months later. He was found to be in good health and gaining weight.

**Fracture of Superior Maxillary, etc.**—A case of compound comminuted fracture of the malar and superior maxilla, with marked comminution of the floor of the orbit and the outer wall of the Antrum of Highmore, was found to be due to a spear thrust. After careful cleansing with 1—100 carbolic, followed by sterile saline, patient was sent to bed. He recovered satisfactorily.

**Malingering.**—One very marked case of malingering was treated during the year. A boy of about 16 years was brought to Hospital in the following condition: The head was kept to the left as in Torticollis, whilst the arms and legs were in a spastic condition, and the patient walked with "scissors gait." He was dumb and

had been in the above state for three months. The condition had come on suddenly. Patient began immediately to shout and talk when threatened with chloroform. When left alone in a room patient assumed a normal position, but immediately returned to the above attitude when any person became visible to him. He was always ready and able to eat his food.

*Pneumonia.*—All cases of acute lobar and bronchopneumonia recovered without any complications.

In acute lobar pneumonia we have found strophanthus, a very useful heart stimulant, and feel that the treatment of the heart in these cases is one of the most important indications.

*Eye Cases.*—A large variety of eye cases are constantly being treated in the hospital, but the majority of the cases, apart from trachoma, conjunctivitis, pterygium, and other minor conditions, were treated for Cataracts. It has been our custom to perform extraction by Smith's method, and we are very satisfied with the large percentage of good results obtained. Although vitreous may be lost more frequently than in the capsulotomy operation, we have not been at all dissatisfied with the results even in these cases. Of the cases which went septic, we found only one which occurred in a case which had lost vitreous. The results of those who lost vitreous compare very favourably with those without loss. In a few cases where large amounts of vitreous were lost we had rather less favourable results as regards sight. In juvenile and traumatic cataracts we still continue to perform the capsulotomy operation. We had several cases of suppuration, without pain, following extraction. We are of the opinion that these cases are due to the organism of trachoma.

In several cases of glaucoma we were pleased with the results got by Eliot's Operation of Trephining.

*Operations on the Ear, etc.*—Of the six operations for mastoid suppuration and middle ear disease performed during the year, only one was of more than ordinary interest.

The patient, aged 45, was brought to the hospital with a history of pains, foetid discharge from the ear, and swelling of the mastoid region. The history extended back for three months before admission. On admission the patient was exceedingly ill, and his condition necessitated immediate operation. The tissues over the mastoid region having been incised and the periosteum detached, it was found that the external shell of the mastoid process was intact. A small portion of this was chiselled away, when immediately a large quantity of pus poured out. This having been cleared away and the opening in the shell enlarged, we found that the whole of mastoid cells had disappeared, resulting in a large cavity. After scraping away the whole of necrosed tissue, it was found that a large part of the bony structure of the roof of the cavity had been destroyed by necrosis. This was especially marked in the region of the tegmen tympani, thus exposing the brain and its membranes. After removal of all diseased structures the cavity was drained in the usual way and the patient sent back to bed. He recovered from the effects of chloroform soon after, and seemed reasonably well.

About six hours after the operation the patient suddenly began to have rigors, which followed one another at short intervals. The temperature rose to 104.7 or more, and the patient became unconscious. Septic sinus phlebitis being diagnosed, immediate operation was decided upon. The internal jugular vein was first ligatured to prevent dissemination of the septic material. When ligaturing it, it was found to be collapsed and empty. On opening the lateral sinus septic clot was discovered and cleared out. The cavity was left with a drain and patient sent to bed. Patient died next morning without becoming conscious.

*Gynaecological Operations.*—Amongst the 35 gynaecological operations performed, there were the following cases:—

1. Ovarian with twisted pedicle.

2. Several cases of inoperable cancerous ovarians were discovered on laparotomy.

3. One septic ovarian tumour with pelvic peritonitis.

4. One huge multilocular ovarian cyst, weighing 48 lbs.

5. One case of ovarian tumour with cancerous degeneration, associated with pregnancy.

6. Hysterectomy was performed three times for—

(a) Extensive cancer of cervix.

(b) Three years old extra-uterine gestation, with foetus in abdomen and adhesions to uterus and surroundings.

(c) For fibroid uterus with marked hæmorrhage.

In the case of ovarian with twisted pedicle the patient gave a history of two previous attacks of slight pain with vomiting, which passed off on taking to bed. The third attack of pain in the lower part of abdomen was much more severe, and associated with vomiting and faintness. This did not improve on resting, so the patient came to the hospital 24 hours after the pain began. On admission she was found to be 34 years of age, and gave a history of a gradual growth of tumour in the lower part of abdomen for two years. On examination the tumour was found to extend as far as the umbilicus. The lower part of abdomen was found to be tender and somewhat rigid, and did not move freely with respiration. On vaginal examination a tense cystic tumour was felt pushing the uterus to the left.

*Operation.*—The usual incision in the middle line about four inches long below the umbilicus. On opening the peritonium, which was congested, a small amount of bloody serum escaped and a dark bluish cystic tumour presented. Running across the anterior aspect of the tumour was part of the tube, at the end of which was the ovary and the ovarian fimbriae. These structures were absolutely black in colour. The vessels over the cyst wall were markedly distended. The pedicle of the cyst was found, on examination, to be twisted once to the right. This being untwisted ovariectomy was performed and the wound closed. Patient made an uninterrupted recovery.

The case of septic ovarian tumour was a patient aged about 34. She was admitted with acute pain in the lower part of abdomen with occasional vomiting. There was no history of tumour. The abdomen was rigid painful to touch, and did not move with respiration in its lower part.

Per. vaginal examination showed slight bulging in all the fornices but no tumour was felt at the time. On opening the abdomen there was an immediate escape of pus in the upper part of the wound, and on further examination a very much inflamed and adherent ovarian tumour, rising from the right side, was found. It was so small in size and had perforated in its upper part. It was so adherent to the surrounding structures that removal was impossible. The perforation in the tumour was stitched up, and a tube was inserted at the side of the tumour into the lower part of the abdomen, for drainage. Then an opening was made through the posterior fornix into the cavity of the tumour and a tube inserted for drainage into the vagina. After prolonged treatment the patient returned home healed and strong.

The huge multilocular ovarian cyst, weighing 48 lbs., was adherent throughout its whole circumference to peritonium, omentum, and at one part to small intestine. After great difficulty the adhesions were separated and some of the larger cavities opened and drained. After this the tumour was delivered and ovariectomy performed. Patient made an uninterrupted recovery.

*A Case of Ovarian Tumour with Cancerous Degeneration Associated with Pregnancy.*—Interesting points about this case were, that on opening the abdomen the tumour was found to be about the size of a football, and its pedicle elongated so as to allow the tumour to reach as far as the liver. In this way room was given to the enlarging uterus. It was found that the cancerous degeneration and spread was very much marked. Adhesions to the liver, stomach, and intestines were firm, so as to be inseparable. A large separate growth was felt towards the region of the left kidney. As removal was



impossible and the patient was suffering greatly from breathlessness, and as there was no room for further growth of uterus, Caesarian Section was performed to give relief to the patient for the short period of her remaining life. Patient recovered from the operation in spite of her emaciation and weakness. She died about six weeks afterwards from exhaustion.

Cases of advanced cancer of cervix and vagina are quite common in the district, but most of them when seen are found to be inoperable. The case in which pan hysterectomy was performed was one in which there was some doubt as to the advisability of the operation, as the patient was very weak and the tumour showed signs of extension to the rectum. But as the patient begged for the operation to be performed, it was decided to make an attempt to totally remove the condition. The usual method of abdominal hysterectomy was followed, but on endeavouring to free the rectum from the tumour a small rent was made in the bowel. This was immediately sutured from vaginal side and the peritonium closed by sutures, leaving a small area for drainage. Patient was, however, too weak for operation and died 24 hours after.

The case of fibroid uterus with marked hæmorrhage was treated by abdominal hysterectomy. The patient made an uneventful recovery, returning to her village happy and strong.

*Case of Extra Uterine Gestation of three and half years history.*—Patient, about 4½ years before admission, had had an abortion at the third month, followed by leucorrhœa, which continued for some time. She gave no history of gonorrhœa or syphilis. About a year following the abortion mentioned above, patient, as she thought, became pregnant again and showed the following signs and symptoms. Enlargement of mammae, milk secretion, and for two months, amenorrhœa, enlargement of the lower part of the abdomen, morning sickness, and one or two nervous symptoms. After the second month she began to have irregular flow of blood in small quantity, and there was gradual enlargement of abdomen up to the ninth month. Patient thought this irregular flow of blood was peculiar, but as the quantity was very little took no notice of it. At about the ninth month patient began to have pains which she likened to those of labour. These continued for three days. When no child was born the patient got some help from a native midwife, who began to rub the abdomen in the downward direction, using oil as a lubricant. During this process the patient felt a sudden sharp, stabbing pain in the lower part of abdomen, which made her faint. At the same time she felt as though something inside her abdomen had burst. With this feeling the tumour diminished in size. She did not lose consciousness at all. Patient did not give a history of any discharge whatever from uterus during the pains. (As nothing came the patient thought that the child had been eaten by a devil.) After this event patient was compelled to remain in bed for one month. When she got up from bed she noticed a swelling which ran obliquely across the lower part of the abdomen, its upper end being on the left side. It was slightly movable. She complained also of pains of a peculiar nature, which affected her once or twice every month until her admission in October, 1914. Now and then also she had retention of urine. During this latter time patient was working as usual in the fields.

*Condition on Examination.*—Inspection.—Patient was a delicate, thin-looking woman. On inspection, a distinct projection was seen running across the lower part of the abdomen, obliquely upwards and to the left. Above the projection the abdominal outline was normal. Movements of the abdomen were normal.

*Palpation.*—In the region of the projection a tumour of varying consistency was felt. At one point about 2" below and 1" to the right of the umbilicus was a small bony projection, rounded in shape in its upper end. It extended downwards, where it disappeared into the tumour. (This was later found to be an arm).

The remainder of the tumour was hard, and gave the impression one gets on feeling a fibroid. The upper and left of the tumour was rounded and somewhat elastic, but not quite hard to palpation. (This was found to be the head of foetus on operation.) The tumour was only slightly movable from side to side, but not at all from above downwards.

*P. V. Examination.*—Revealed the cervix projecting downwards and forwards. It was very low down. A fibroid-like tumour filled up the fornix. The uterus was not to be felt separate from the tumour, nor could the cervix be moved apart from it.

*Operation.*—Incision about 4" long, extending from just below the umbilicus. On opening the peritonium the foetus was seen lying obliquely across the lower part of abdomen with the head to the left. The bony projection below and to the right of umbilicus was found to be the elbow of the foetal right arm. The omentum was adherent along the foetal back, and on separation of these adhesions other firm adhesions to the peritonium at the front, sides and back of the child were discovered. The head was so firmly adherent in the region of the descending colon, that another incision at right angles to the first was found necessary in order to ensure careful separation of the bowel and other adhesions. Having separated all visible adhesions of peritonium, etc. in this way, the child was drawn out of the abdomen, as far as adhesions in its lower part would allow. On careful examination of these, it was found that the foetus was so firmly attached to the uterus and tubes by them that separation was impossible. In fact the fundus and the greatest part of the body of the uterus could not be distinguished or separated from the child. This being the case, supra vaginal hysterectomy was immediately performed in the usual way. Structures representing the right fallopian tube and its appendages were found firmly adherent to the anterior surface of the child. It was found necessary to remove with the child the right ovary, and the body of uterus as far as the "Internal Os". Having treated the cervix in the usual way, the wound was closed layer by layer. Patient was sent to bed and made rapid recovery. She was able to leave hospital about the fourteenth day.

The foetus seemed to be about the size of a seventh month child.

There was also during the year a woman of forty years of age with a large ovarian tumour with malignant degeneration. Two buckets full of coffee-coloured viscid fluid were drawn off. The tumour was very adherent to the peritoneum of the anterior and lateral aspects of the abdomen. Patient did well and returned home after ovariectomy.

There was also towards the latter part of the year a woman admitted with the history of retention of urine and tumour. On examination it was found to be a broad ligament cyst. It was dissected from between the layers of broad ligament of the left side. Patient returned home minus her tumour and trouble.

Laparotomy was performed for a dermoid cyst in the pelvis of a woman aged 38. On examination it was found so adherent to the rectum and surrounding structures, as a result of malignant degeneration, that removal was impossible.

*Operations on the Alimentary Tract.*—During the year there were the following interesting cases:—

(a) Four cases in which gastro-jejunostomy was performed.

(b) Two cases of radical cure for strangulated inguinal hernia, one of which demanded resection of bowel as a result of gangrene.

(c) Laparotomy was performed for tubercular peritoneum in two cases. In one case there were ulcers on a part of the small intestine just in the region of cæcum, for which lateral anastomosis was performed in order to give the diseased part of the bowel, which was three feet long, a rest and chance of healing. The



patient was too weak for resection whilst disease of peritoneum contra-indicated it.

*The first case of Posterior Gastro-Jejunostomy* was performed in an old man of 55 for obstruction of the pyloric end, resulting from previous ulcer. The patient, on admission into hospital, complained of obstruction of the bowels, which had lasted for four days. There was history also of faecal vomiting for two days, and on admission patient continued to have this type of vomiting. On endeavouring to give him an enema, it was found that the fluid would not go into the rectum, but immediately returned by the side of the tube. On examination of abdomen, it was found to be markedly distended in its whole extent. The sides were found to be bulging. There were no ladder patterns.

*Percussion.*—Tympanitic in the upper part, dull in the lower part of the abdomen.

Examination from rectum gave one the sensation of some cystic tense tumour which prevented the examining finger from being properly inserted.

*Operation.*—On opening the abdomen by an incision which extended 3" just above the umbilicus it was found that a cystic tumour wall was so tensely distended within the abdomen that the examining hand could not be inserted to any extent. On further careful examination we determined the tumour-like structure to be a very greatly distended stomach. As little could be done with it so greatly distended, a small opening was made in its anterior aspect after packing off the rest of the peritoneal cavity. As soon as the opening was made there was a rapid escape of gas and large amounts of coffee-coloured fluid. Having carefully cleared the organ through this opening, it was closed by means of Lembert sutures. On examination the organ was found to be exceedingly large, whilst at the pyloric end there were found adhesions and the scar of a large ulcer. Gastro-entrostomy was decided upon and performed. Patient lived till the following day and died of toxemia, resulting from obstruction. The stomach was not able to return to its normal size owing to marked distention in spite of gastro-entrostomy.

The history of gastric ulcer some ten years back was only elicited from the patient's friends after the operation in spite of careful questioning before.

The other three posterior-gastroenterostomies were performed for obstruction of pylorus. One middle aged man died of double pneumonia, whilst the other two returned to their villages much stouter than when they came to the hospital.

The two cases of radical cure for strangulated inguinal hernia showed no extraordinary points. The case in which resection of the bowel was performed was one in which the strangulation had continued for eight days before the admission. The strangulated portion of the bowel, about 3" in length, was absolutely gangrenous and showed signs of perforation. This was resected, leaving a healthy margin of bowel for end to end anastomosis, which was performed immediately. Patient was not able to recover from the effects of toxemia, and passed away the next morning.

The second case of strangulated hernia was admitted at an earlier stage and was soon dismissed cured.

*Operations on Genito-Urinary System.*—Of the fifty operations on the genital tract, most were external urethrotomies performed for impassable strictures. In one or two cases of marked retention of urine Cock's operation was performed.

There was one case of rupture of bladder, with escape of urine into the peritoneal cavity, resulting in death from toxic absorption. Patient was brought in practically moribund and died soon afterwards. The rupture resulted from a fall from a tree on to a branch lower down.

One case of perineal lithotripsy was performed for the removal of a very large calculus, which could not be caught by the small lithotrite, which was allowed to enter the bladder because of the small size of the urethra of the child.

## A CASE OF CALCULOUS PYONEPHROSIS COMPLICATED BY URETHRAL STRICTURE, INTERNAL URETHROTOMY, NEPHRECTOMY AND RECOVERY.

By KENNETH BLACK, F.R.C.S. (England).

CAPT., R.A.M.C.,

*Consulting Surgeon, Skegness Hospital, Lincolnshire, Specialist in Advanced Operative Surgery to the Bombay Brigade.*

PTE. P. F. J., aged 42, was admitted to the Gerard Freeman Thomas War Hospital, Bombay, on 22nd June, 1917, with a discharging sinus in the right loin. He stated that since December 1916 he had been troubled with debility and increasing weakness, but had no colic or pains in the loin; this had developed insidiously. It proved to be an abscess, which was opened and drained, the wound soon healing. Pus, however, re-collected, and the abscess was again opened. On this occasion the wound did not completely heal, a small sinus persisting. Up to this time, apparently, kidney disease was not suspected.

On admission there was a small discharging sinus in the right loin, associated with slight fever; no trace of urine was detected coming from the sinus, as methylene blue was administered by the mouth and produced no blue colouration of the pus. The urine contained a large quantity of pus and albumen, but there were no crystals, casts or blood cells present. Both kidneys were X-rayed on several occasions; no abnormality could be detected in the left renal region, but on the right side a dark shadow was evident in the renal region and there was evidence of the presence of calculi in the lower part of the kidney. There was an old very tight stricture of the urethra, which permitted the passage of a fine catheter only. On July 4th I performed an internal urethrotomy, and at the end of August I was able to cystoscope the bladder; this showed trabeculation of the mucous membrane, indicating back pressure; there was no cystitis. Pus was seen coming from the right ureter and clear urine from the left. The ureters were catheterised, and from the right pure pus was obtained and from the left normal urine.

On August 31st, assisted by Captain J. E. B. Macqueen, I.S.M.D., I removed the right kidney through an incision in the loin. The kidney was very much enlarged and adherent to the surrounding tissues, which were excessively fatty and fibrous. On opening the kidney it was found to be a loculated shell full of pus, containing several small calculi in the lower part of the pelvis; there did not appear to be any normal kidney substance remaining. The accompanying plate shows the kidney as it appeared just after removal. A small tube was inserted in the wound, which was then closed. The patient made a rapid recovery, and was discharged apparently completely cured to England five weeks after the operation.

A case of Calculous.





Recurrent Fever  
SYPHILIS

# GALYL

Framboesia and  
Sleeping Sickness

Practical work with GALYL in the shape of

**60,000 INTRAVENOUS** (Dilute and Concentrated) and **INTRAMUSCULAR INJECTIONS** administered in Military, Naval and the principal General Hospitals throughout the United Kingdom, has demonstrated that this preparation is **more rapid and less toxic** in action than any compound of the "606" group, which accounts for the **consistently excellent clinical results without any undesirable by-effects.**

### Forms:

FOR INTRAVENOUS INJECTIONS:—  
(1) **DILUTE.**—GALYL is supplied in neutral glass ampoules containing the necessary dose of Sodium Carbonate, sterile distilled water only being used for the dissolution.

(2) **CONCENTRATED.**—A special outfit containing one dose GALYL, one ampoule sterilised solution, and one small filter is supplied.

### Doses:

0.10—0.15—0.20—0.25—0.30—0.35—0.40

(3) FOR INTRAMUSCULAR INJECTIONS:—  
GALYL is supplied in **OILY EMULSION.**

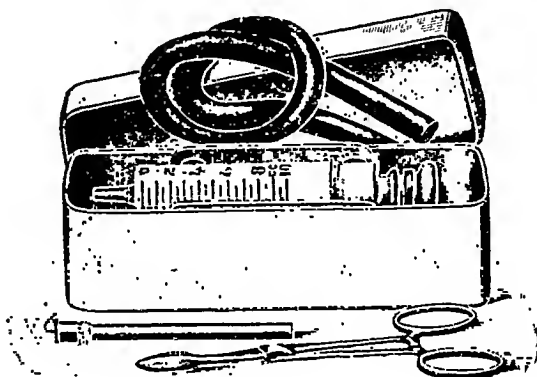
### Doses:

0.10—0.15—0.20—0.30—0.40.

## POCKET CASE.

Containing the entire instruments (sterilizable) necessary for administering a concentrated intravenous injection of GALYL or other solution.

- 1 India-rubber Tube for constricting the arm.
- 1 Clamp for fixing the rubber band.
- 1 Glass Syringe of 10 c.c. capacity.



- 1 Platinum-iridium Needle, length 4 cm., diameter 0.9, with short bevelled joint and special barrel. Attachable to the syringe without any additional junction.
- 1 Nickel-plated Case to hold all the above.
- 1 Chamois Leather Pouch.
- 1 Glass Filtering Tube, with rubber attachment.

Price complete 30/-

## HECTINE

**Formula:** Sodil Benzo-sulphio-p-amnia-phenyl arsonas.

Dr. Mouneyrat—the discoverer of Galyl (the well-known and widely adopted French Neo-Salvarsan substitute) and also Hectine—a compound which, though it possesses a very low arsenic percentage and has proved most safe in use—gives remarkably successful clinical results in syphilis and the parasymphilitic affections. Hectine has a record of about one million injections.

Hectine is not only a specific in syphilis, but it acts as a general tonic in the treatment of bloodless and anemic patients and in all cases where **Arsenic** is indicated.

In malaria it acts as a specific owing to its anti-parasitatory and anti-thermic actions; also in tuberculosis, rachitism, neurasthenia, asthma, chorea, skin diseases, etc., etc.

**Hectine** is supplied in hermetically sealed ampoules for intramuscular injections.

Ampoules A—containing 10 c.g. in 1 c.c.

Ampoules B—containing 20 c.g. in 1 c.c.

Pills (in phials of 24) 10 c.g.

## HECTARGYRE

(Mercurial Salt of Hectine)

Hectargyre being a **double specific** cures syphilis and all its manifestations more rapidly and more surely than any other mercurial preparation.

As a treatment following Galyl, or *ab initio* in all stages of the disease, Hectargyre is very effective and rapid; it is well tolerated even where prolonged treatment is necessary; the most intractable cases of syphilis have yielded highly satisfactory results.

Hectargyre is supplied in sterile ampoules for intramuscular injections.

Ampoules A containing—

Hectine 10 c.g. }  
Hg. 1 c.g. } in 1 c.c.

Ampoules B containing—

Hectine 20 c.g. }  
Hg. 1½ c.g. } in 1 c.c.

Pills containing—

Hectine 10 c.g.  
Protoid of Hg. 1 c.g.  
Opium Extract 1 c.g.  
(in phials of 24 pills)

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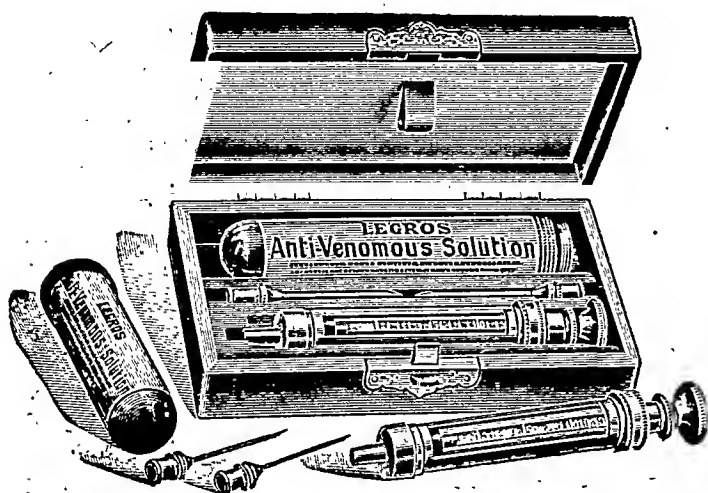
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Gamage Building, Holborn, London, E.C. 1.

Telegrams: "ANPSALVAS, LONDON."

# Rational Scientific Treatment of Bites of Venomous Serpents or Stings of Venomous Insects on Man and Animals.

## THEIR CURE—



BY THE USE OF—

## Michel Legros' Outfit

Dr. Michel Legros' Outfit is put up in a strong little case (3.2 x 1.6 x 0.8 in.) and weighs 1 oz. It takes up no more room in the pocket than an ordinary match box, and can therefore be carried without inconvenience.

Dr. Michel Legros' Outfit contains—

- 1 Tube of Solution for four injections.
- 1 strong metal-mounted Syringe.
- 2 adequate Needles.

Dr. Michel Legros' Solution is always effective and may be kept any length of time.

Separate Tubes of Solution are supplied at very moderate prices.

FULL DIRECTIONS SUPPLIED WITH EACH TUBE OR OUTFIT.

## Rational Treatment of Constipation

By the double action of Secretions and Peristalsis

# O P O L A X Y L

Opolaxyl is a combination of the secretions of the liver (biliary), pancreas, and intestines, with vegetable extract of a non-drastic nature.

It combines all the secretions to correspond to nature's therapy, and promotes a flow of bile and glycogen with their hæmatopoietic and antitoxic properties.

It is a normal regulator of the gastro-intestinal functions; consequently it improves the metabolic exchanges in the entire organism.

DOSE.—For obstinate constipation 2 or 3 tablets, afterwards 1 tablet every 3 or 4 days for a month.

## LEGROS' SOLUTION AND SNAKE BITES.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I beg to send you notes on the use of Michel Legros' Anti-Venomous Solution in cases of snake-bite, which may be kindly inserted in the *Indian Medical Gazette*.

Recently I was called to see a case of snake-bite. A boy, aged about 18, was bitten on his right foot by a cobra at about 7 A.M. The patient immediately after the bite tied a ligature tightly round the leg below the knee with a rope which he carried with him for his cattle, and cried aloud for help. His neighbours hurried up to the place and killed the serpent which lay hidden in an adjacent bush. The serpent was 4½ feet long, and its diameter at the middle was 5½ inches; many native *ojhas* assembled and tried their *mantras*. At about 8.30 A.M. symptoms of poisoning developed, notwithstanding the three additional ligatures tied by the men subsequently. I reached the place at 9 A.M., when the condition of the patient was as follows:—Eyes opened and turned upwards, the tongue fixed between the teeth which could not be separated, the heart's beat was very feeble, limbs cold. At once I injected 15 minims of Anti-Venomous Solution on the right forearm and 15 minims in two places on the right thigh which was much swollen. After ten minutes I again injected 10 minims into the left forearm and 15 minims in two places near the site of the bite, and made several incisions near the site of inoculation and freely rubbed in crystals of Pot. Permang. I left the patient at 1.30 P.M., when he could speak with ease and all the symptoms had considerably subsided. He only complained of severe pain in his right leg, for which I prescribed hot Permang. bath. Next morning the patient was all right.

From the above it will appear that the life of the patient was saved by Michel Legros' Anti-Venomous Solution.

It is a very simple remedy, administration of which requires no special skill; my tube of solution was about a year old, and I understand the solution keeps well for several years.

The following points are most important:—The venom is not, as a rule, carried immediately in its entirety into the circulation (except in cases when the bite has penetrated into a vein, in such cases death may be caused immediately). The venom first reaches the small blood vessels by its own action on blood, the local circulation is arrested, and this prevents the immediate diffusion of the poison throughout the organism.

When the poisoning symptoms have already developed, a dose should be injected into the healthier tissues above the wound and swollen parts. Another should be given in two or three places near the site of the bite. This may be repeated if the condition of the patient becomes more grave. The solution must be injected deeply into the tissues for rapid absorption. Medical practitioners can easily and conveniently carry a tube of solution containing four doses at the nominal cost of Rs. 4 per tube.

Yours, etc.,

S. G.,

BINODPUR, JESSORE,

20th June, 1917.

Medical Practitioner.

SAMPLES ON REQUEST. LITERATURE ON APPLICATION.

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## The Combined Treatment of SYPHILIS.

## SUPSALVS

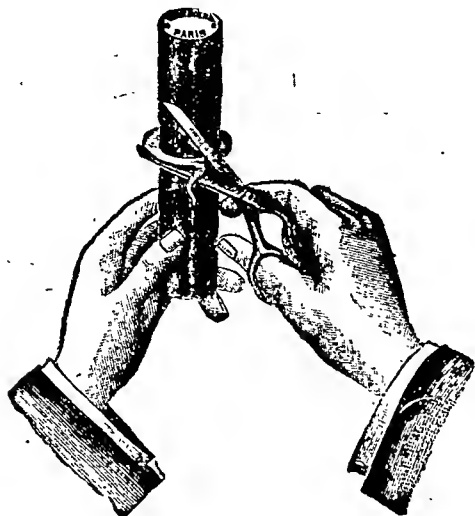
STABLE SUPPOSITORIES OF  
"606" (of French Manufacture)

FIG. 1.

Fig. 1 represents the special patent metallic envelope containing a Supsalv for hot climates. The projecting edge in the middle is cut by scissors—the two ends are then easily pulled apart. The envelope should first be immersed in cool or iced water for 10 minutes.

At the International Congress of Medicine Ehrlich stated that the biochemical action of "606" on spirochaetes is not direct but indirect; a third factor found in the body fluids being necessary.

This success is explained by the well-known experiment of Levaditi: "If living treponemas be placed in a solution of Arsenobenzol (Ehrlich's 606) they continue to live in it. But if a trace of extract of liver be added to the mixture the treponemas are destroyed."

"If 606 has to be taken up and transformed by the liver in order to become toxic to the treponema, there is no better mode of absorption of the drug than by way of the intestine, since all the veins of the intestines join the portal vein. If this be the case no route could be more indirect and more unsatisfactory for active treatment than one that is not intestinal or not intravenous (i.e., prehepatic), since some of the drug must necessarily become fixed everywhere before the passage through the liver has activated it."—Dr. Sabouraud, La Clinique (13-4-1913).

As a result of numerous clinical experiments, Dr. Bagrov, of Moscow, has arrived at the same conclusion, and recommends the rectal method of administration of 606.

**200** cases were treated by the combined treatment in one of the London hospitals. In each case a negative reaction was attained.

Extremely Simple in  
use.

No Ill-effects.

Most Satisfactory  
Clinical Results.

Rapid Absorption.

## MERSALV

FOR MERCURIAL INJECTION IN  
CONNECTION WITH SUPSALVS  
TREATMENT.

**CHEMISTRY.**—"Mersalv" contains 10 per cent. metallic mercury, which by a special mechanical process exists in the minutest state of sub-division possible. It is a non-greasy preparation, and, in contra-distinction to other mercurial preparations, contains no organic fats or oils. "Mersalv" is of a white creamy consistence, of pleasant odour, and *cleanly in application*.

In Special Glass Stoppered Bottles for Hot Climates.

## IODOGÉNOL

IODINE in its Most Reliable and Palatable Form.

IODOGÉNOL is a preparation containing Iodine in an organic, assimilable and one might almost say "living" form.

IODOGÉNOL possesses about 38 times the physiological activity of that of iodide of potassium: this preparation has, according to the clinical reports of eminent professors, succeeded where the usual iodide treatment had failed after producing undesirable by-effects.

IODOGÉNOL does not produce Iodism or other bad symptoms.

IODOGÉNOL is an undoubted digestive stimulant and promotes appetite and has a markedly beneficial effect on the general nutrition. It has been tried in many of the large hospitals, and given highly satisfactory clinical results in cases of

Syphilis, Rheumatism, the various phases  
of Tuberculosis, General Debility, etc.

20 minims of IODOGÉNOL are equivalent to 8-grs. Iodide Potassium.

## BIOSULFOL

(Assimilable Colloidal Sulphur.)

A Great Advance in Sulphur Treatment.

Sulphur administered in this form by the digestive tract is entirely absorbed (90% in worst cases and 100% in others).

Biosulfol gives beneficial results with which ordinary Sulphur medication, owing to its being only in a small part assimilated, cannot compare.

## INDICATIONS:

Chronic Affections of the Pharyngeal and Bronchial Mucous Membrane.  
Chronic Affections of the Genital Mucous Membrane.  
Chronic Rheumatism (Polyarthritides deformans).  
Various Affections of the Joints.  
Intestinal Intoxication.  
Skin Diseases.  
Mercurial and Lead Poisoning, etc.

## DOSAGE:

Biosulfol is prescribed in a one-teaspoonful dose, to be taken during each of the two principal meals, pure or in water or milk. It is quite palatable.

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'Phone: HOLBORN, 1311.

Antipyrin, Phenacetin, and Pyramidon  
superseded.

## CRYOGENINE

LUMIÈRE.

**NON-TOXIC. EFFICACIOUS. HARMLESS.**

Adopted by the French Ministries for War and the Navy, also by the Poor Relief Board. Papers on "Cryogenine" have been read before various Medical Societies by over 90 of the most eminent Continental Medical Men. In each paper clinical results of the most satisfactory character are recorded. "Cryogenine" is a white crystalline powder, odourless and almost tasteless; its chemical composition is Metabenzamido semi-carbazide.

Cryogenine has a high reputation as a

**GENERAL ANTIPYRETIC and POWERFUL ANALGESIC.**

FORMS.—Tablets, Pills and Powder.

LANCET, Dec. 18th, 1909, p. 1812: "..... The above case is one out of a number of successful results obtained from the use of this remedy (Cryogenine) contrasted with Pyramidon, which certain writers regard as the best drug for phthisical temperature. I think there can be little doubt 'Cryogenine' is the safer and more efficacious antipyretic. ...."

J. E. G——, M.D.

**A Great Advance in the Treatment of BURNS—Slight or Severe.**

## AMBRINE

(Method of Dr. BARTHE DE SANDFORT.)

AMBRINE instantly alleviates pain.

Promotes rapid healing.

Forms a sure protection against infection of the Wound.

Although the dressing with AMBRINE is seclusive and adhesive, it becomes after a short period non-adhesive, and can be removed without pain, hæmorrhage, or injury to the newly-formed tissues. The healing takes place without leaving scars or contractions.

**Supplied to** The British Navy. British Red Cross. Many Ordnance and other large Works. The French Ministry of War and Marine. The French Red Cross. The Italian, Belgian, and Rumanian Governments. The French Railway Companies. The Carnegie Trust Company, U.S.A., &c.

### INDICATIONS:

|           |            |                 |
|-----------|------------|-----------------|
| BURNS     | CHILBLAINS | VARICOSE ULCERS |
| NEURALGIA | SCIATICA   | NEURITIS        |
| PHLEBITIS | RHEUMATISM | GOUT, &c.       |

The British Medical Journal, Sept. 2nd, 1916.

Re AMBRINE TREATMENT.

"..... The primary and quite incontestable advantages of the treatment are two: it is agreeable to the patient because entirely painless; it is convenient to the surgeon because easily and quickly applied. .... It is possible that the treatment would be useful in dealing with ordinary ulcers and in any case it is certain that the study of its application to the raw surfaces is worth pursuing...."

The SCIENTIFIC TREATMENT of HAY  
FEVER and allied ailments.

## KINECTINE

According to Dr. MOUNEYRAT, the discoverer of Galyl and Hectine (the widely adopted Salvarsan Substitutes).

### FORMULA:

Chlorhydrate of Quinine c. Hectine—i.e., Benzo-sulfone-para-amino-phenyl-arsenate of Quinine.

Non-toxic, produces no ill-effects.

Easily taken (tablets) and well tolerated.

Highly satisfactory clinical results:—

AS A PROPHYLACTIC AGAINST HAY FEVER, &c.

RAPID ABORTIVE ACTION IN THE INITIAL STAGES.

CURATIVE ACTION IN THE ADVANCED AND CHRONIC CONDITIONS.

## NEOCAINE-SURRENINE

Neocaine is a synthetic product of French manufacture.

**A Perfect COCAINE SUBSTITUTE of Low Toxicity.**

A White Powder, readily soluble in water. Analgesic power, duration, and rapidity of action quite equal to Cocaine.

Toxicity less than one-sixth.

Therapeutical effects identical with Cocaine (excepting as an exhilarant) for Dental or Surgical local and Spinal Anæsthesia, Lozenges, Snuffs, Ointments, &c.

### Composition of Neocaine-Surrenine:

|                                     |     |     |          |
|-------------------------------------|-----|-----|----------|
| Pure Neocaine                       | ... | ... | 5 c.g.   |
| Acid Borate of Adrenalin (Takamine) | ... | ... | 0.1 m.g. |

Pure Neocaine is also supplied.

FORMS.—Powder in capsules and phials. Ready prepared solutions in Ampoules (various percentages), and Ampoules of sterilised liquid for making solutions.

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# Indian Medical Gazette.

FEBRUARY.

## LATHYRISM.

Two excellent papers by Dr. Ralph Stoekman, of Glasgow University, appear in the *Edinburgh Medical Journal* (November, 1917) on the subject of Lathyrism in man and animals.

The subject is one which has not attracted attention in India for over a dozen years, but it is one which any return of famine will certainly again bring to the front.

The disease in India was first well described by Major-General Sleemam (*Rambles and Recollections*, 1844), but a paralytic affection to the use of certain peas or vetches has been known since the days of Hippocrates.

The best account published in India of recent years has been the Report on Lathyrism in the Central Provinces submitted to Government by Lt.-Col. Andrew Buchanan, I.M.S., in 1904. About the same time the present editor published a case which occurred in the Bhagalpore Jail (*Jour. of Trop. Medicine*, Vol. I, 1899), and the photograph then published is reproduced by Dr. Ralph Stoekman.\*

The disease is known in many countries, but in India it has always been an accompaniment of famine or scarcity, due to the fact that this grain, which can grow under adverse conditions, is then most largely used by poor people. Outbreaks are on record in Italy, France, and Algeria.

In India the Central Provinces have most frequently been affected, but during the scarcity of the years 1897-99 the present writer saw many cases in Shahabad district.

The form of pulse, the prolonged and too exclusive use of which gives rise to this form of spinal paraplegia, is that popularly known in Bengal as *khesari*, or as *teora* in the Central Provinces, *Lathyrus sativus* or the "chickling vetch."

The composition of this pea is practically identical with other peas as regards protein, fat and carbohydrates. The plant is largely used as

a fodder for cattle, but it is well known in European countries that the continued use of this grain often produces paralysis of the hind legs in animals,† and the horse is specially susceptible.

Dr. Stoekman gives a detailed account of his feeding experiments on monkeys: paresis of the motor nerves was produced but *post-mortem* examination showed little or no changes and the spinal cord showed on microscopic examinations, "No pathological changes."

The poisonous body is an alkaloid, but is present in very small quantity (300 grammes of seed husks only produced a mere trace of the alkaloid). The active principle is not yet known.

Acute cases are met with in animals, but few have ever seen or recognised any cases in man. The action of the poison is gradual and accumulative, and the symptoms essentially chronic.

## Current Topics.

### SHORTAGE OF MEDICAL STUDENTS IN ENGLAND.

THE following memorandum has been forwarded to the War Office, London, on the question of the shortage of medical students as a result of the continuance of the Great War:—

"1. The Committee of Reference feel it their duty to call the serious attention of His Majesty's Government to the certainty that, owing to the enlistment of medical students as combatants in the years 1914 and 1915, the numbers of doctors to become qualified in the near future must fall short of the requirements of the nation, unless immediate steps are taken to meet the situation.

"2. From the returns which have been supplied to the General Medical Council, it was shown that at the beginning of the year 1916 there were in the medical schools the following students:—

| Entered as Student in | Therefore in 1916. | Men.  | Women. | Total. | Eligible to Qualify in |
|-----------------------|--------------------|-------|--------|--------|------------------------|
| 1915 ... 1st year     |                    | 1,422 | 636    | 2,058  | 1921                   |
| 1914 ... 2nd "        |                    | 783   | 295    | 1,078  | 1920                   |
| 1913 ... 3rd "        |                    | 519   | 163    | 682    | 1919                   |
| 1912 ... 4th "        |                    | 1,078 | 145    | 1,223  | 1918                   |
| 1911 ... 5th "        |                    | 922   | 140    | 1,062  | 1917                   |
|                       |                    | 1,302 |        |        |                        |
|                       |                    | 2,000 |        |        |                        |

"3. Since the Government has decided that fourth and fifth year's students who can possibly qualify in two years may continue or resume their medical studies, the supply of doctors for 1917 and for 1918 may be considered as fairly assured so far as to fill the gaps in the profession caused by the usual losses by death and retirement, but it cannot be said that the losses brought about by casualties in the field will be made good, nor

\* It is worth notice that this Bhagalpore case practically recovered the use of his limbs and was seen by the writer seven years later still in Jail but practically fit and well.  
—ED., I. M. G.

† The possibility of some cases of *Kumri* ("gone on the loins") being Lathyrism should not be overlooked. Grains are often mixed, and how many horse-owners would recognise the *khesari* among the grains given to horses?—ED.

does it provide for any increase that may be required for the R.A.M.C.

"4. From the figures given in the above return the students of both sexes in their second and third years, who should qualify in 1919 and 1920, are considerably less than those who should qualify in 1917 and 1918. They are 1,302 males as against 2,000; males and females together, 1,760 against 2,285.

"5. So far as males are concerned, these figures represent a number considerably in excess of those who can possibly qualify in 1919 and 1920, for a large proportion of them have either voluntarily joined or have been called up under the Military Service Act into the combatant ranks.

"6. The large number in the first year, that is, those who should qualify in 1921, is entirely misleading, because a large proportion of these male students are under 18 years of age, and are therefore called up to join the army as soon as they reach the age of military service.

"7. Whilst there is likely to be an increase in the number of qualified women doctors in the near future, it should be pointed out that they are not suitable for all hospital appointments nor for all forms of general practice, and, of course, are not available for the navy or army. It must, therefore, not be assumed that an increase of women doctors can compensate for a serious shortage of male doctors.

"8. The only conclusion that can be drawn from the above is that the outlook for the maintenance of the numbers of qualified doctors after the year 1918 is extremely serious for the needs of the civil population as well as of the navy and of the army.

"9. The Committee of Reference would draw the attention of His Majesty's Government to the hardships inflicted by the present arrangement on the medical student who enlisted or took a commission before the Military Service Act compared with his fellow-student who did not enlist, and is therefore a fourth or fifth year's student. The former has had to defer, in many instances by three years, the earliest date of his qualification, whereas the latter has been allowed to continue his medical studies until qualified. The Committee would therefore suggest that it is only fair to those whose patriotism led them to enlist in the early days of the war that they should be allowed to return to their medical studies.

"10. The Committee of Reference, in consequence of these facts, earnestly desire to impress upon His Majesty's Government the necessity of taking immediate steps to meet this shortage, and they recommend—

"(a) That medical students now serving in the army, whether as officers or privates, who have already passed the examination in anatomy and physiology for a medical qualification, should be demobilised and returned to their medical schools to complete their studies.

"(b) That medical students now serving in the army, whether as officers or privates, who have not passed the examination in anatomy and physiology, should be seconded to their medical schools for a reasonable period to enable them to pass that examination, and that if successful they should be demobilised to complete their studies.

"11. It is, in the opinion of the Committee, highly desirable that effect should be given to these recommendations as soon as possible.

"FREDERICK TAYLOR, M.D.,  
Chairman.

30th August, 1917."

The Central Medical War Committee, after consideration of the above memorandum, passed the following resolutions:—

"1. That in the opinion of this Committee it is desirable that all medical students who are registered as such in the books of the General Medical Council, or, in case of doubt, present a certificate from the dean of their medical school, now serving with the navy or army as officers or privates, should be demobilised to continue their studies.

"2. That in the opinion of this Committee the calling up of more medical students who are registered as such in the books of the General Medical Council, or, in case of doubt, present a certificate from the dean of their medical school, and who have completed their first year of study, should cease."

It was decided that these recommendations, together with a covering letter pointing out that the deficiency in the numbers of first, second, and third year students is much greater than appears from the table given above, should be forwarded to the Prime Minister, the Minister of National Service, the Adjutant-General, the Director-General of the Army Medical Department, and the President of the Board of Education.

#### THE FOURTH VENEREAL DISEASE.

UNDER this title Dr. Corbus of Chicago, in 1909, has described a fourth venereal disease, otherwise called *Erosive balanitis*. Corbus found it in about 1 in 50 of his hospital venereal patients. As a matter of fact in addition to syphilis, soft sore, and gonorrhœa, we, in India, have long known a 'fourth' venereal disease *ulcerative granuloma* (which has recently been described in these pages). At any rate this fourth or fifth disease is again fully described in the *Journal of Laboratory and Clinical Medicine* (St. Louis, September 1917, No. 12, Vol. II) by Dr. R. G. Owen.

It has been defined as "a specific infectious venereal disease due to the symbiosis of a vibrio and a spirochæte, with local and constitutional symptoms varying with the severity of the infection."

We quote in full the description given by Dr. Owen—

"The disease usually begins on the sulcus coronarius, prepuce, or glans; usually as one, sometimes as several small superficial erosions which may heal in the course of a few days without treatment. At times the surface of these ulcers may show a bright red colour, while at other times they are covered with a grayish film of coagulated exudate and necrotic tissue. Where several small lesions are present, they usually coalesce in the course of a few days.

The most, in fact the only, characteristic symptom of this type of venereal sore is the early and abundant production of a white or yellowish pus of a most foul odour. This pus, however, may be lacking in the early stages of the disease, or may have been kept in abeyance by mechanical cleansing.

The lymphatic glands are enlarged and usually painless, with the dorsal lymph cord sharing in the lymphatic involvement. Aside from the inguinal region there is no adenitis. Suppuration of the affected lymph glands does not occur.

The majority of patients show no constitutional symptoms, but in the gangrenous type where the destruction of tissue may be rapid and extensive profound sepsis may supervene.

Phimosis and swelling appear early and are often marked, making treatment difficult without surgical intervention.

#### DIFFERENTIAL DIAGNOSIS.

This type of sore is most apt to be confused with chancroid, as both have the same incubation period, the sore usually appearing within two to seven days after exposure.

In chancroid, however, the ulcers are more likely to be multiple, and show contact infection on apposing surfaces which we have not observed in balanitis; and there is much greater tendency manifest to undermining of the edges of the ulcer with the production of a ragged and irregular border. Painful inguinal adenitis with resulting bubo is common in chancroid, but has not been observed in balanitis of this type.

Balanitis cases show more abundant pus of a foul odour, and produce earlier and more marked edema and swelling. Phimosis is very common and appears quite early.

The process is differentiated from the Hunterian chancre by the much shorter incubation period, by the rapidity of development of the pathologic process, and the production of the pus described above.

However, we have long ceased to depend on visual observations alone in differentiating between chancre and chancroid; for while there is a typical hard chancre, it is so often masked by an accompanying chancroidal infection that diagnosis is difficult if not impossible.

Indeed, we have found that at least 30 per cent. of our cases of true syphilis are complicated by a chancroidal infection, and such cases can be diagnosed with certainty only by means of microscopic and serologic methods.

#### RATIONS OF THE TROOPS IN MESOPOTAMIA.

The following is an abstract of a paper read by Colonel W. H. Willcox, C.M.G., Consulting Physician to "D" Force, at a meeting of the Medical Society at Amara:—

The importance of selecting a correct scale of rations for the soldier was very great. Many considerations had to be borne in mind, *viz.*: (1) the physiological value of the ration, (2) the total daily vitamine value of the ration, (3) ability to provide the various necessary items, (4) the possibility of transport of the components of the ration along a long line of communications in great heat, and (5) economical considerations.

[The ration scale of G. R. O., I. E. F. "D" July 4th, 1916, and the revised scale of G. R. O., I. E. F. "D" October 31st, 1916, were carefully considered.]

#### BRITISH RATION.

In each ration scale there was a very good ration, provided that facilities as regards climate, transport, etc., permitted the full supply of the various items. The physiological value of each ration scale was good, there being an ample but not extravagant margin of protein, fat, and carbohydrate. The vitamine value of each scale was adequate. Trouble arose when, owing to difficulties of transport and intense heat, there was difficulty of supply of fresh meat and fresh vegetables, etc.

#### INDIAN RATION.

In the ration scale of July 4th, 1916, the Indian ration showed a deficiency of protein and fat, and a large excess (100 per cent.) of carbohydrate. The revised ration scale of October 31st, 1916, showed, if *atta* (Indian flour) were supplied, an adequate amount of protein and fat, but the carbohydrate was

in large excess (70 per cent.). If rice were substituted for *atta* then there was a deficiency of protein and of fat, while the carbohydrate excess reached 100 per cent.

It is interesting to compare the rice or *atta* issue to Indian troops in the revised ration scale, *viz.*, 1½ lb. per day or 10½ lbs. per week, with the flour or bread issue to the civil population in England in the voluntary ration system which has been introduced. The Indian allowance is more than double of the latter.

#### DISEASES DUE TO VARIATIONS IN THE RATION SUPPLY.

*Anæmia and Debility.*—These occurred in the summer in both British and Indian troops, when, owing to transport difficulties and the great heat, the supply of fresh food (meat, vegetables, and fruit) was short.

#### VITAMINE DEFICIENCY DISEASES.

*Scurvy.*—This was limited to Indian troops—practically no cases occurred in British. The Indians have very little reserve against scurvy, and in their own country often are on the borderland of scurvy. If he is subjected to deprivation of antiscorbutic vitamins in his dietary, the Indian readily falls a victim to scurvy, while the British soldier remains immune. In the hot weather of Mesopotamia the supply of fresh vegetables of necessity was much reduced, and it was owing to this and the action of the heat itself on the bodily functions that in the months May to September scurvy was of frequent occurrence in Indian troops. Fresh meat undoubtedly has an antiscorbutic value, and the inherent dislike of this by some of the Indian troops is one of the factors of the occurrence of scurvy amongst them.

The antiscorbutic value of various articles in the ration scale was considered—*e.g.*, sour limes, potatoes, onions, spinach or fresh vegetables, fresh fruit (all have a high antiscorbutic value). Dates and raisins were no doubt antiscorbutic; tamarind eaten as a chutney, or as an acid drink after infusion and sweetening, was, no doubt, antiscorbutic. "Cocum" had a reputed antiscorbutic value, but as it was often wasted and in any case of little value it would be well for it to disappear from the ration scale for Indians. As already stated, fresh meat has undoubted antiscorbutic value. Tinned fruits and dried vegetables have probably little antiscorbutic properties, since the process of preparation has very likely destroyed their vitamins. Tinned milk has little, if any, antiscorbutic value owing to the destruction of the vitamins by sterilisation. For the same reason pickles probably have little antiscorbutic value. Fresh milk is well known to be antiscorbutic, but the dangers of supply of this to troops, owing to the risk of cholera or enteric group infection, entirely prevent its issue to troops in the field. Lime-juice has had a long reputation as an antiscorbutic. If made from fresh limes and not kept too long before its issue to troops it is undoubtedly a valuable preventive of scurvy. Measures have been taken to ensure a supply of efficient lime-juice of good antiscorbutic value to the troops in Mesopotamia. Probably the most valuable antiscorbutics are fresh sour limes and raw potato. Raw potato can be made into a palatable salad by being cut up into small slices and mixed with onion and a little vinegar. In this way it has been used with great success in the treatment of early scurvy.

*Beri-beri.*—This disease has occurred in British troops, but practically no cases occurred in Indians, if one excludes the Indian prisoners taken at Kut and afterwards exchanged by the Turks. The occurrence of beri-beri is in the winter months, *e.g.*, December and January, unlike scurvy, which occurs in the hot months. In December, 1915, and January, 1916, a number of cases occurred in British troops. Beri-beri has been shown to be a vitamine deficiency disease. The anti-



beri-beri vitamines occur in the aleurone layer of the grain beneath the husk and also in the germ of the grain. The British flour owing to its excessive refinement, involving the almost complete removal of the aleurone layer with the husk, and also of the germ, is not protective against beri-beri. The Indian flour, *atta*, contains the aleurone layer and the germ of the wheat grain, so that it is protective against beri-beri. Also the *dhall* in the Indian dietary is protective against beri-beri. It is for these reasons that the Indian does not run the risk of getting beri-beri.

On medical advice the British ration after July, 1916, was made to include oatmeal and at times *dhall* also yeast has been well known to be rich in anti-beri-beri vitamines.

Researches were carried out by the War Office, and it was found that an extract of yeast made under special conditions was extremely rich in anti-beri-beri vitamines. This has been issued to the British troops in Mesopotamia since the autumn of 1916 as a ration under the name of "marmite." Marmite is in taste and appearance like extract of meat, and can be taken as it is or in stew or soup.

It has been interesting to note that very little beri-beri has occurred in the British troops in the winter of 1916, and not a single death has occurred from this disease. The cases that have occurred have been of a very mild character.

A very convenient method of providing the British soldier with anti-beri-beri vitamines is to make his bread of a mixture of British flour and *atta*. This bread is very palatable, and has a high protective value against beri-beri. The trial has been made with success in the force in Mesopotamia.

As regards "economic considerations," a considerable saving without any lack of efficiency could be secured by reducing the excessive ration issue of *atta* and rice to Indian troops, provided that the small amounts of protein and fat in the withdrawn carbohydrate food were replaced in other ways.

#### NOTES ON PARASITES,

*Paragonimus ringeri*, the human lung fluke.

It has been assumed of latter years that all "lung flukes" belong to one species. These flukes, members to the genus *Paragonimus*, are found in Asia, in Japan, in America, and in the Philippines; and Ward and Hirst have of recent years given good reasons for the belief that for each of the first three areas there is a different species of *Paragonimus*. They find that the Asiatic species, parasitic in the tiger, claims by right of priority the name *P. westermanii*; that to the Japanese species, distributed over Japan, Formosa and Korea, and parasitic in man and in the dog, falls the name *P. ringeri*, given originally by Cobbold to material collected by Dr. Ringer and forwarded by Manson; while to the American form, found hitherto in the pig, dog and cat, has been given by Ward the name *P. kellicotti*. The systematic position of the Philippine form is still undetermined.

The main differences between these species lie in the cuticular spines. In *P. westermanii*, these are lancet shaped and very slender, and in distribution sparse, irregular and single; in *P. ringeri* they are chisel shaped and moderately

heavy, and lie in circular rows, but collected into groups; and in *P. kellicotti* they are chisel shaped and heavy and lie singly in circular rows. The excretory pore lies in *P. westermanii* at the posterior pole, in *P. ringeri* somewhat ventral and in *P. kellicotti* somewhat dorsal of this extremity. There are also differences in the relative sizes of the two suckers and of different parts of the alimentary canal, and apparently some differences in the genitalia.

It is to be noted that of these three forms, the only one hitherto reported from man is *Paragonimus ringeri*.

#### A RECENTLY FOUND OCCASIONAL PARASITE OF MAN.

THE list of parasites of animals which have occasionally managed to attain, or nearly attain, the adult state in man is constantly increasing. Recently Professor Henry B. Ward has reported from a girl, 16 years old, who had never left the neighbourhood of Arkansas, U. S. A., a Nematode belonging to the genus *Gongylonema* (a genus no member of which has hitherto been found parasitic in man), and probably to the species *G. pulchrum*, normally parasitic in the pig. It behaved like a *Loa*, wandering about between the fauces and the lips, and was finally detected as a fine thread about three-quarters of an inch long lying under the mucous membrane of the lip. It dodged the first attempt to hook it out, retreating towards the corner of the mouth, but at the second attempt the needle was got fairly under it, and it was caught and pulled out.

Before the extraction the girl was extremely anæmic and very cross and irritable, but after its removal she rapidly improved and became a different person altogether.

The specimen was an immature female. The members of the genus ordinarily live under the mucous membrane of the œsophagus of mammals, though one species is parasitic in the chicken. The intermediate host of *Gongylonema pulchrum* is the croton bug, and it was probably by this intermediary that the girl was infected.

#### THE MINTO OPHTHALMIC HOSPITAL, BANGALORE.

DR. S. V. RAMASWAMY IYENGAR has published a handsome and interesting report on the work of this fine new Ophthalmic Hospital since 1913 when it was opened, and the figures given show conclusively the usefulness of the institution. At present there are beds for 104 patients. The building is a handsome one. Granula Ophthalmia is very common, and it is said that the pannus cases showed a tuberculous tendency and were "put (says the Report) on Tuberculin injections." The number of cataract cases has increased from 364 in 1913 to 595 in 1916, and the percentage

of success is claimed to be 97.58. On this subject the Superintendent notes as follows:—

The usual method adopted is capsulotomy with extraction and irrigation of anterior chamber. The Superintendent generally does this without iridectomy, and the Resident Medical Officer with iridectomy. The cataract include both primary and secondary. It will be seen from the tables that the percentage of failures in secondary cataract is higher, and naturally this is due to the condition of the eye itself. In more than half of the cases of failure there were fundus changes. The estimation of vision is done in more than half of the discharges. It generally ranges from 6/36 to 6/12 and J. No. 1 and J. No. 2 with ease. The rest are not tested, as they do not desire to wear glasses nor is there sufficient staff to do this work as routine method. Only the very poor are supplied with cataract spectacles gratis.

In pursuance of section 3 of the Indian Medical Degrees Act, 1916 (VII of 1916), the Governor-General in Council is pleased to authorise the institution, known as the Assam Medical Examination Board, to confer, grant, or issue in British India degrees, diplomas, licenses, certificates or other documents stating or implying that the holder, grantee or recipient thereof is qualified to practise western medical science.

THE Burma Sub-Assistant Surgeons Association contributed over two thousand rupees towards "Our Day" realised from a "Scientific Exhibition" held from 10th to 16th December with the "Grand Fancy Fair" in Rangoon, a drama enacted with the assistance of the students of the Burma Medical School and subscriptions from members of the medical profession.

Colonel P. C. H. Strickland, I.M.S., Inspector-General of Civil Hospitals, Burma, Lt.-Col. C. C. Barry, C.I.E., I.M.S., and Lt.-Col. P. Dee, I.M.S., were the patrons.

The Scientific Exhibition scored a record success and the admiration of the public. The Lieutenant-Governor paid a visit to the exhibition which had an educative value. X-Ray, Tinsen Light, models of organs, specimen of healthy and diseased organs, model operation room, ward with all the instruments and accessories, germs of common diseases under microscope were demonstrated and explained. The various schools were given concession rate.

|   | Rs.   | A. | P. |
|---|-------|----|----|
| Net income from the Scientific Exhibition | 1,028 | 15 | 6  |
| " " " " Drama ...                         | 270   | 10 | 9  |
| Subscription from members ...             | 715   | 6  | 0  |

## Reviews.

**Hygiene and Public Health.**—By Sir A. WHITELEGGE and Sir GEORGE NEWMAN, 13th Edition, revised, etc., 1917. Cassell & Co., Ltd.

THIS admirable little book has been before the medical profession for over 27 years, and has been

frequently revised. It is now in its 13th edition, and the work has largely fallen to the hands of Sir George Newman, the Emeritus Lecturer on Public Health at "Barts."

The new edition has been thoroughly revised, new sections have been added and others cut out or curtailed. In spite of 32 added pages the book still remains the small compact volume, characteristic of Cassell House's excellent series of little red-back volumes.

The chapter on diet is good, and we notice that Chittenden's opinion as to protein and total food value is quoted as gospel. We understood that Chittenden's results were upset and their value rendered negative by the bad behaviour of the men on whom he had to rely for carrying out his experiments. If this is a fact, and we believe that it was stated to be so in an American scientific journal, it is obvious that it is unsafe to quote Chittenden's results. This is a very important matter, and the above statement should be investigated.

The book contains very useful chapters on the Sanitary Laws, Factory Acts, National Insurance, the Housing Act, etc., and a series of model bye-laws.

We can strongly recommend this excellent little volume as an up-to-date and reliable summary of the facts of public health and hygiene.

**Notes on Compounding.**—By H. F. LECHMERE TAYLOR, M.D. Published by the Medical Mission Association of India. 3rd Edition. Price, As. 8.

THIS is the 3rd edition of a useful pamphlet which many Civil Surgeons and medical officers would do well to purchase and distribute to their hospital "dressers" and "compounders."

It must necessarily follow familiar lines, but it is well put together. The poison regulations are clearly set forth.

The following headings will show better than pages of description the substance of this pamphlet, weights and measures, poisons, solutions, solids in stock solutions, percentage solutions, prescriptions, the B. P. waters, infusions, plasters, extracts, liniments, pills, lotions, powders, ointments, and a useful list of common names for medicines, e.g., Laudanum for tinct. opii., and Vitriol for strong sulphuric acid, etc., etc.

The pamphlet is certainly useful and practical.

**Livingstone's Catechism Series**—Pathology, Part IV. 2nd Edition. Edinburgh, E. & E. LIVINGSTONE. Price, 1s. 3d.

THE front part of the Catechism series on Pathology deals with inflammation, mainly, and the process of repair, ulcers and ulceration, tubercular inflammation, infection, contagious diseases, carriers, germ and soil fever, types with charts, repair, immunity, disease of the lungs and bronchi.

It is, as usual in this series, up-to-date and accurate and can be recommended to students.

**A Manual of Practical X-Ray Work.**—By DAVID ARTHUR, M.D., D.P.H., and JOHN MUIR, B.Sc., M.B., Ch.B., &c., CAPT., R.A.M.C.T. Pp. 357; illustrations, 185. 2nd Edition. Wm. Heinemann Ltd., London. Price 12-6, net.

THE 2nd edition of this well-known Manual claims to be a complete guide to diagnosis by X-Rays. The therapeutical section contains a valuable description of the treatment of ringworm, but is in many respects not complete, as the size of the book limits its scope.

Nearly one-half of the book is devoted to a description of the various apparatus in use, and this section will be of the greatest value to beginners. The illustrations are ample and the individual apparatus are clearly described. There is also a good chapter on Photography.

The localization of foreign bodies is dealt with in refreshingly simple language, and only the best methods are selected.

The volume will be welcomed by all young radiologists as a valuable guide to the whole subject of practical X-Ray work.

**The Silwanighat Hydro-Electric Project.**

MR. E. BATCHELOR, I.C.S. (Pioneer Press), has published an interesting pamphlet on the hydro-electric project at Silwanighat in the Chhindwara district, C. P.

It is not only an account of this particular project, but it gives a vast number of details as to the value and cost of such projects in India.

It will be of very considerable value to Engineers and District Officers. No doubt we are only in the very beginning of electric development in India; but the success of such projects in Kashmir, on the Cauvery River and in the recent Tata scheme in the Bombay Presidency points to a much greater use of this power in India in the future. We can certainly recommend this pamphlet.

**Manual of Pharmacology.**—By TORALD SOLLMANN, M.D. Philadelphia of London, 1917. W. B. Saunders Co. Price 20s. net

THIS is a very handsome and complete treatise on Pharmacology and its applications to Therapeutics and Toxicology by Dr. T. Sollmann, Professor of Pharmacology and Materia Medica in the Western Reserve University, Cleveland, U. S. A.

The volume is one for study and for reference. The essentials of Pharmacology are printed in large type, while the more detailed data are given in smaller print.

The book is in accord with the United States Pharmacopœia, but will be found of immense value to readers of all countries. A very complete note is added on radio-active metals, and the bibliography is most extensive and thorough.

We can certainly recommend this big volume to all who require a standard book of reference on Pharmacology.

**Collected Papers on Analytical Psychology.**—By C. G. JUNG, M.D., LL.D. Baillière, Tindall & Cox, London, 1917.

THIS is the 2nd edition of Dr. Jung's collected papers on Analytical Psychology, translated by Dr. Constance E. Long. The volume contains material collected and written during the past fourteen years. Certain additions have been made to this addition, notably a new chapter on the "Concept of the Unconscious." The work is a statement of the views of the Zurich School, of which Dr. Jung is the leader, as opposed to the teaching of the Viennese School, led by Freud. The latter maintains that neuroses are the result of repression and that the origin of repression lies in sexuality. Jung agrees that neuroses arise from repression but denies their origin in sexuality, and in this connection develops his ideas of introversion and extroversion. As the author points out, it is a relief to any one who is acquainted with Freud's Sexual Theory to find that he need not necessarily look upon his brain as an appendage of his genital glands. At the same time the great importance of sexuality is recognised and freely admitted. The book is essentially one for the earnest student of Psychology; in it he will find much food for reflection and a wealth of suggestive information. The great significance of the complicated psychic processes in the child is insisted on, and the importance of Psycho-analysis in their investigation pointed out. The book is well bound and clearly printed.

**Disease of the Skin**—By Sir MALCOLM MORRIS, K.C.V.O. Cassell & Co., Ltd., 1917. 12s. net.

THE 6th edition of this manual, written with the assistance of Dr. Ernest Dore, which appears after the 5th edition, has been out of print for some months. The sections of Syphilis and Radium have been enlarged, and in the former have been embodied the recommendations of the Royal Commission on Venereal Diseases as regards diagnosis and treatment. It is superfluous to dilate upon the manifest excellence of this work, which is, in our opinion, the best of all the smaller books on this subject. We note that the author reports favourably on Sir Leonard Rogers' treatment of leprosy by Sodium Gynocardate. In spite of new material added the book has not grown in bulk, as the author has adopted the plan of having the sections dealing with the more uncommon diseases printed in smaller type. The plates, a most important feature in a work on Skin Diseases, are numerous (eighty-two) and strikingly good. The printing and binding are also in accordance with the well established reputation of Messrs. Cassell & Co.

**The British Journal of Surgery.**—Vol. V, No. 18, October 1917. Subscription 31s. 6d. net; per annum, post free. Issued quarterly. Single numbers 8s. 6d. net. Bristol: John Wright & Sons, Ltd.

THE notice of one of the older Surgeons in this number is of one John Halle 1529—1568, whose chief endeavours were devoted to the raising of the status of surgery and the restraint of quacks; unfortunately there is not very much known about him, but what there is makes interesting reading.

E. W. Hey Groves has a long paper on the transplantation of bone for the repair of defects whether caused by injury or disease. The results and conclusions of the earlier and some more recent workers in this field of surgery are first described beginning with Ollier and going on to Barth, Axhausen and MacEwen. Their work is reviewed and then follow the original experimental observations of the author which are so based as to determine the best methods of transplanting bone. Different forms of graft and various ways of fixing them were employed and the results carefully considered, and some valuable results were obtained. The concluding portion of the paper is devoted to the more practical side of the question and is quite sound, and we quite agree that keeping the fingers out of the wound is somewhat of a fetish and that sound mechanical fixation, accurate fitting and tight suturing is the more important in this connection. The author's pattern of saw should overcome one of the difficulties in cutting the graft. A list of the author's clinical cases are omitted for lack of space, but will be included in a late issue.

Colonel Andrew Fullerton, A.M.S., has a paper on gunshot wounds of the kidney and ureter as seen at the base, based on a series of 42 cases. The local effects on the organ together with the microscopical appearances are well described; other sections deal with cystoscopy, the value, X-Ray examination, signs and symptoms and so on. The method of trying to reconstruct the course of the bullet by sectional anatomy should be found to be useful, and the remarks of estimating the function of the kidney are also of value; altogether the paper well repays perusal. A painstaking enquiry into the pathology of projectile fracture of the limb bones is made by Major E. K. Martin and Captain G. F. Petrie, R.A.M.C., with an analysis of the rate of penetration of various micro-organisms and the factors which influence this and shows evidence of a very considerable amount of careful work.

Other minor features of this number are illustrations of War Surgery, rare cases and instructive mistakes. The printers are to be congratulated upon the excellence of the illustrations.

**The Treatment of War Wounds.**—By W. W. KEEN, M.D., LL.D., Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. Pp. 169. Philadelphia and London. W. B. Saunders Company, 1917. Price \$1.75 net.

THIS little book is a memorandum on some of the more important recent improvements in the treatment of war wounds. Professor Keen has collected opinions from many surgeons at the front, and with his own ripe experience to help discusses the best methods of treatment at present available. The Dakin-Carrel method is described in some detail, with the aid of several figures, followed by chapters on stereoscopic localisation, tetanus, gas gangrene and wounds of the head, chest, joints and abdomen. In no case do the chapters pretend to completeness; they are merely notes on recent improvements in methods. The "Ambrine" treatment of burns is dealt with, and the newest antiseptics—Dichloramin-T, Acriflavine, and Brilliant Green are noticed, the results obtained being stated to be encouraging. There is nothing in the text which will not be familiar to all who have followed the current literature of War Surgery.

**A System of Hand and Finger Re-education (for use in Military Orthopaedic Gymnasia).**—By Captain G. W. SEWELL, M.C., London. Baillière, Tindall and Cox, 1917, pp. 16. Price 6d. net.

THIS pamphlet describes and illustrates a simple system of re-education by means of wall diagrams, over which the hands and fingers are moved, different diagrams being used for the production of flexion, abduction, etc. The method enables the medical officer to measure the amount and rate of progress and should prove a useful adjunct in the treatment of these cases.

## ANNUAL REPORTS.

### THE BOMBAY BACTERIOLOGICAL LABORATORY.

ONE always expects something good from this report, and in spite of the war's interference with his staff, Lt.-Col. Glen Liston, C.I.E., has been able to produce a report full of interesting matter. As is well known, this laboratory does a twofold work—it is the laboratory which supplies all India with anti-plague vaccine, and it is a research laboratory for the Presidency of Bombay. One hears less of inoculation work against plague in these days, but the increasing demand for anti-plague vaccine means an increased recognition of its usefulness, and in fact the output of the laboratory has practically doubled in 5 years, and now over 14 lakhs of doses are yearly issued.

Fewer details than usual are given of the effects of inoculation as a plague preventive.

measure, but Lt.-Col. Liston quotes one useful example—

"The town of Ilkal is situated in the Bijapur district: it has a population of 10,233 persons in normal times. Plague appeared in the town on the 6th November and continued to prevail till the 25th March 1914. The total number of deaths in and around the town during the epidemic was 146. As generally happens when plague breaks out in a town in India, many people left the town and lived either in camps outside the town, or in other towns and villages, during the prevalence of the epidemic. A rough census of the population actually living in the town during the epidemic was first made in January 1914. It was ascertained that at that time about 1,200 persons only resided in the town. In March a second census showed that the number of residents still in the town was reduced to 1,080. Of the residents who had remained in the town throughout the epidemic, 794 were inoculated and 286 were not inoculated. Among the inoculated there were 12 attacks and only 3 deaths, while among the smaller number of uninoculated there were 35 attacks and 30 deaths."

#### RESEARCH WORK.

*H. C. N. for the destruction of rats.*—It is not much used for rats, but more useful to destroy the minor vermin.

Research work in connection with plague has been restricted to the practical application of Hydrocyanic Acid gas for the destruction of rats and fleas in houses. A number of different types of machines for generating and distributing the gas were designed and constructed. These machines were tested on a practical scale in houses in Poona City. The experiments showed that with suitable precautions this gas can be used with safety and with some success. Although some of the rats in a house were killed by the gas, others survived. Rats placed in deep boxes or barrels, or near the tiles of the roof of a house in which the gas was used, escaped death. The gas being lighter than air failed to diffuse into deep barrels or boxes during the short period the house remained closed, and the concentration of the gas was not great enough to kill the rats placed near the roof, because fresh air, blown into the room through the tiles, sufficed to sufficiently dilute the gas, so that it was no longer harmful to the rats.

The action of the gas on insects was found to be more marked than on mammals. Bugs, fleas, cockroaches and mosquitoes were readily killed, but certain grain weevils were found to be more resistant.

The gas has been successfully used to destroy bugs in hospitals and houses. A simple form of apparatus has been designed for use in hospitals for the destruction of bugs in beds, bedding and clothing.

A table is given which shows the close relationship between the rat epizootic and the human epidemic.

The following note on the *rarity of Tuberculosis in Indian Cattle is of value* :—

"The study of tuberculosis has engaged special attention. Dr. Soparkar continued his researches on the prevalence of the bovine type of tubercle in human beings in India. Up to the present date he has not been able to recover the tubercle bacillus of the bovine type from human cases of tuberculosis in India.

An interesting outbreak of bovine tuberculosis in the Victoria Gardens has been investigated.

An experiment to test the susceptibility of the Indian cattle (buffalo and cow calves) to tuberculosis has been completed. It has been shown that while on the one

hand, with rare exceptions, all English calves die of acute miliary tuberculosis when inoculated with 50 milligrammes of a culture of bovine tubercle bacillus, on the other hand 50 per cent. of Indian calves, whether they are buffalo or cow calves, live for many days after a similar dose of the bovine tubercle bacillus, and when killed showed retrogressive or healing tubercular lesions. This finding is in agreement with the general experience that Indian cattle are less commonly affected by tuberculosis than English cattle are, and supports the view that the comparative infrequency of the disease among cattle in India is due to a natural resistance to the disease, rather than to any method of housing or keeping cattle in India as compared with Europe. Some Indian calves, however, were found to die quickly after the subcutaneous injection of even ten milligrammes of culture, so that Indian calves showed a greater individual variation in susceptibility to infection by the tubercle bacillus than English calves. It follows that the comparative rarity of tuberculosis in Indian cattle must, in part at least, be attributed to diminished opportunities for acquiring infection. The possible existence of tuberculosis among imported breeds of cattle, and their liability to contract tubercular infection, is therefore a source of danger to indigenous herds."

We are glad to note that it has been found that *Kharsivan* and *Arsenobillon* have been found to be useful substitutes for Salvarsan.

The question of the introduction of Biharzia infection into India by troops returning from Egypt is a matter of considerable importance, and has been taken up.

#### WORK IN THE BOMBAY WAR HOSPITALS.

Towards the end of June 1916 the great increase in the number of sick arriving in Bombay from Mesopotamia and East Africa led to the expansion of hospital accommodation in

Bombay, and the need arose for specialist medical services. It was under these circumstances that the resources and staff of the Bombay Bacteriological Laboratory were placed at the disposal of the Director, Medical Services, and under his orders the charge and organisation of the pathological and bacteriological work of the War Hospitals in Bombay was undertaken by the Director of the Laboratory with the assistance of his staff in addition to their other duties.

The centralising of the bacteriological and pathological work of the War Hospitals at Parel effected great economy in material and equipment. The services of the staff of the laboratory, which were voluntarily rendered, secured a sufficiency of trained men to enable the rapidly increasing work to be accomplished efficiently and well. A separate report has been furnished dealing with the bacteriological and pathological work done at the War Hospitals; it will suffice here to mention that at the Bombay Bacteriological Laboratory 6,506 samples of blood were examined by the Widal test up to the close of the year. One hundred and twenty different strains of organisms, chiefly typhoid, paratyphoid, dysentery and cholera, have been carefully examined and identified. Two hundred and seventy-five samples of milk have been analysed, and a large number of other specimens, totalling in all 149,657, have been examined at Parel in connection with this work.

**The Enteric Dept.**—Accommodation at Parel was provided for convalescent Enteric cases.

Lieutenant Mackenzie Wallis' services were utilised as a chemist. He devoted his attention to the prepara-



tion of a substitute for "nutrose" which is an ingredient of a commonly used medium for the cultivation of the typhoid bacillus. "Nutrose" being a German patent preparation was no longer obtainable in the market. Lieutenant Mackerzie Wallis prepared Nutrose, and has described the preparation and the use of this valuable food in a paper published in the Indian Journal of Medical Research, Volume 4, No. 4. In the same journal he has published a paper on the use of Aromatic Chloramine compounds for the sterilisation of water for drinking purposes.

From the date the Enteric Dépôt was opened at the Bombay Bacteriological Laboratory, 523 patients passed into it and 229 men have been discharged from the Dépôt after completing their course of examinations. Six of them harboured *Bacillus paratyphosus* A, while one carried the *Bacillus typhosus*. All the para. A cases were faecal carriers. The case excreting *Bacillus typhosus* had a sinus connected with the sternum, from which a pure culture of the bacillus could always be obtained.

#### BIHAR AND ORISSA HOSPITALS' REPORT.

THE triennial report on the hospitals of Bihar and Orissa has been submitted by the Hon. Colonel G. J. H. Bell, C.I.E., I.M.S., who succeeded the late Colonel F. J. Drury as Inspector-General in 1916.

The report is full of interest and we make the following extracts:—

"On the 1st January 1914 there were nineteen Indian Medical Service officers employed in the general line in Bihar and Orissa. One of these officers was transferred to the United Provinces of Agra and Oudh to hold a professorial appointment in the Medical College at Lucknow, and in consequence of the demands of the military authorities fifteen officers were surrendered on the mobilisation of the field army, with the result that only three Indian Medical Service Civil Surgeons were left in the province on the 31st December 1916. Two Civil Surgeons belonging to the Indian Subordinate Medical Department were also recalled to military duty. The vacancies in the Civil Surgeoncies have been filled by the temporary employment of two European Doctors, and the remainder by the officiating promotion of Civil Assistant Surgeons."

*Sub-Asst. Surgeon's reluctance to go on Military duty.*—The following outspoken remarks of Government in the Resolution on this report are deserved, but not creditable to the Sub-Asst. Surgeons:—

"As the result of the outbreak of war, the Local Government were called upon to surrender fifteen officers of the Indian Medical Service and two Civil Surgeons who belonged to the Indian Subordinate Medical Department. At the present time there are only three Civil Surgeons belonging to the Indian Medical Service in the province. The vacancies have been filled by the temporary employment of two European Doctors and by the officiating promotion of Civil Assistant Surgeons. A few Civil Assistant Surgeons have volunteered for military duty. Forty-four Sub-Asst. Surgeons have also been deputed to military duty under the terms of their agreements, but the Lieutenant-Governor in Council observes with regret that many of these officers did all in their power to evade their obligations, with the result that no less than ten had to be dismissed for refusing to join, while one has since deserted. This strong aversion to military duty is believed

to be the cause of the difficulty which is being experienced in securing recruits for the service at the present time. In spite of a general increase in the rates of pay and the prospects now offered of promotion in certain cases to the rank of Assistant Surgeon, only two permanent recruits have been obtained since October 1914."

We much regret to see this aversion to military duty, which usually only means service in a military cantonment up-country. It is not creditable to this fine body of most useful medical men.

**Increased Attendance.**—"It is satisfactory to note the steady increase in the daily average attendance of women and children also, apart from men, during the last triennium. This feature may be considered as a sign of the increasing faith in Western medical science and a greater inclination to continue the course of treatment."

**Leprosy.**—"The Civil Surgeon of Gaya also made some experiments with the Gynocardate of Sodium, which is derived from the chaulmoogra oil, and the use of which by hypodermic injection has been recommended by Lieutenant-Colonel Sir Leonard Rogers, I.M.S. The unsatisfactory results so far are reported to be attributable to the slackness of the medical subordinate in charge. The experiment is still being continued, and a full report on the subject will be submitted to Government in due course."

**Plague.**—"The iodine treatment in cases of plague was given a trial in some of the districts in this province. The reports received from the medical officers who tried this drug showed that, while tincture of iodine proved to be of some efficacy in mild cases and at the early stages, it had an uncertain effect in advanced cases and when unaccompanied by other stimulants."

**Tubercle of the Lungs.**—"At all hospitals and dispensaries there was a gradual increase from 1911 to 1914 in the cases treated for tubercle of the lungs, the number having risen from 2,924 in 1911 to 4,646 in 1914. It then fell to 4,199 in 1915 and again to 4,021 in 1916. The steady decrease in the triennium under report is more probably due to better diagnosis on the part of the medical officers than to an actual diminution of phthisical patients, the majority of whom do not attend dispensaries at all. Five hundred and fourteen persons suffering from this disease sought indoor treatment in 1916 against 549 in 1915 and 521 in 1914. The death-rate amongst them was 18.5, 19.1, and 20.2, respectively. The gradual decrease in the percentage of deaths during the three years under report is most satisfactory, especially in view of the fact that the death-rate amongst this class of patients was almost half of that in the neighbouring Presidency of Bengal, in which, excluding the Calcutta institutions, the percentage of mortality was 34.76 in 1914 and 36.08 in 1915. Lieutenant-Colonel J. G. P. Murray, I.M.S., Civil Surgeon of Cuttack, is of opinion that the prognosis in this disease is bad among hospital patients, and in spite of being kept in a well-ventilated ward, with the use of cod-liver oil and tuberculin, most of them show a steady advance of the disease. This is, he considers, probably due to the fact that the majority of them come in for treatment only at a late stage of the disease. The early cases are seldom seen, and if they do come to hospital for medicine they do not consider themselves sufficiently ill to remain there. In the last Triennial Report it was remarked that the ordinary wards of our hospitals and dispensaries were not at all suitable for the treatment of phthisical patients. The need for providing special tuberculosis wards, constructed on

modern principles in all important hospitals, has been fully recognized, and the construction of such wards has been sanctioned by Government at the Bankipore General, and Chapra, Bhagalpur and Ranchi Sadr Hospitals, but only the ward at the last named institution has been constructed up to this time. Those at the other three places will be built soon, and it is hoped that it may be possible at no distant date to erect similar wards at all the remaining Sadr hospitals. At Puri there is a charitable Home for consumptives which is entirely maintained by private charity, chiefly by the Tahirpur Raj family, and is reported to be doing useful work. It is resorted to chiefly by the people of Bengal. More similar institutions are badly wanted in this province. The proposal to provide at Provincial cost accommodation for the patients of Bihar and Orissa at the King Edward Memorial Sanatorium at Bhowali in the Naini Tâl Hills proved abortive owing to the dearth of accommodation available. A sanatorium located at a suitable spot within the province would be useful, and it is possible that steps may be taken for its establishment when financial conditions are more favourable."

**Surgical Operations.**—"The number of operations performed in all classes of hospitals and dispensaries during 1916 was 148,076 against 144,766 and 140,583 in 1915 and 1914, respectively, or a total of 433,425 in the present against 376,771 in the past triennium. The increase which is represented by 15'04 per cent. is most satisfactory. The general advance from year to year in the surgical work of the medical institutions during the present as well as the past triennium is a matter on which the medical officers serving in the province may be congratulated. In consideration of the surgical relief which can be afforded by personal visits of the Civil Surgeons to villages at a distance from head-quarters, the Government of the United Provinces agreed in 1913 to these officers remaining on tour for a fortnight continuously. This is no doubt a step in the right direction, for much good may be done in the matter of medical relief by officers making tours of longer duration in the interior of their districts and visiting villages and, if required, operating on the spot. Some of the Civil Surgeons in this province perform operations for cataract and some other important operations during their visits to subdivisional and other dispensaries. It would be desirable if all Civil Surgeons could arrange, when possible, to follow this procedure. The operations performed in classes I, III and IV institutions, the details of which are given in Statement G, amounted to 110,562 in 1914, 115,629 in 1915, and 118,325 in 1916. The results of these operations are given in the following table:—

| Year. | Cured.  |             | Relieved. |             | Dis-<br>charged<br>otherwise. |             | Died.   |             |
|-------|---------|-------------|-----------|-------------|-------------------------------|-------------|---------|-------------|
|       | Number. | Percentage. | Number.   | Percentage. | Number.                       | Percentage. | Number. | Percentage. |
| 1     | 2       | 3           | 4         | 5           | 6                             | 7           | 8       | 9           |
| 1916  | 112,634 | 96·36       | 3,606     | 3·08        | 425                           | ·36         | 234     | ·20         |
| 1915  | 110,965 | 96·62       | 3,311     | 2·89        | 332                           | ·29         | 243     | ·20         |
| 1914  | 105,716 | 96·60       | 3,276     | 2·99        | 241                           | ·22         | 208     | ·19         |
| 1913  | 96,426  | 95·94       | 3,601     | 3·58        | 234                           | ·28         | 202     | ·20         |
| 1912  | 94,305  | 95·55       | 3,880     | 3·93        | 319                           | ·32         | 193     | ·20         |
| 1911  | 91,031  | 96·26       | 3,060     | 3·24        | 284                           | ·30         | 190     | ·20         |

From the figures shown in the above table, it is remarkable that while the death-rate has remained almost stationary, the percentage of the cured has increased in the present triennium. This is probably due to the improvements made in the operating rooms and the surgical equipment of hospitals, and also to the special attention now paid to surgical cleanliness and asepsis. On the whole there has been a considerable increase in selected operations, the number having risen from 8,631 in 1913 to 10,013 in 1916. The net increase was 1,382 or 16 per cent. The numbers of the more important operations performed during the three years are shown below:—

| Operations.                       | 1914  | 1915  | 1916  |
|-----------------------------------|-------|-------|-------|
| 1                                 | 2     | 3     | 4     |
| Amputation ... ..                 | 434   | 435   | 414   |
| Operations on Skull ... ..        | 23    | 23    | 36    |
| Cataract ... ..                   | 3,907 | 3,345 | 3,671 |
| Laparotomy ... ..                 | 44    | 69    | 87    |
| Lithotomy ... ..                  | 65    | 87    | 85    |
| Litholapaxy ... ..                | 75    | 71    | 85    |
| Ovariectomy ... ..                | 14    | 24    | 15    |
| Operation on Abscess of the Liver | 51    | 47    | 49    |
| " for radical cure of Hernia      | 137   | 146   | 147   |
| " " Strangulated Hernia           | 79    | 80    | 66    |
| " " Scrotal Tumour ...            | 350   | 317   | 297   |

It will thus be seen that, amongst the important operations, the largest number was performed for the extraction of the lens, a subject which has already been dealt with in the paragraph regarding the diseases of the eye. Amongst the operations on scrotal tumour as many as 596 were performed at the Cuttack General Hospital, and these were successful in all except two cases in which the patients died of shock and hæmorrhage. Altogether seven deaths only resulted from this class of operation in the whole province during the period under review. The largest tumour removed at the Cuttack General Hospital weighed 70 pounds after excision. Such large tumours are reported to be rare now-a-days. The reputation of the Cuttack General Hospital has been so much established in respect of this operation that patients go there for treatment from all the neighbouring districts and Feudatory States, and sometimes even from Calcutta. Amongst cases of laparotomy, lithotomy, litholapaxy, ovariectomy and of operations for the abscess of the liver and for hernia there were altogether 29, 9, 17, 7, 27, and 28 deaths, respectively, during the triennium. Considering the very serious nature of the affection for which these operations are performed, and the advanced state of the disease before the patients seek relief, the mortality in all these cases, though somewhat high, is probably not susceptible of much reduction. The largest number (12,927) of operations of all kinds was performed at the Bankipore General Hospital. Next to it comes the Gaya Pilgrim Hospital with 10,654, followed by the Bettiah King Edward VII Memorial Hospital with 10,557 operations. Amongst the officers who performed a larger number of selected and more important operations may be mentioned the names of (1) Lieutenant-Colonel G. E. Sunder, M.D., I.M.S., with 2,814 operations in Patna; (2) Lieutenant-Colonel A. F. Stevens, I.M.S., with 1,363 in Gaya; (3) Dr. R. H. Pulipaka, with 1,317 in Shahabad and Gaya; (4) Lieutenant-Colonel J. G. P. Murray, M.D., I.M.S., with 603 in Cuttack; (5) Dr. Chandra Kanta Chakravarti, with 959 in Saran; and (6) Rai Bahadur Tripura Charan Guha, with 1,740 at Bettiah in Champaran. A large amount of surgical work is also done at the various Mission hospitals in the province. At the Bamda Mission Hospital in Monghyr, 8,383 operations of

all kinds were performed during the triennial period under review.

"Since the close of the triennium, the following revised scale of pay for Sub-Assistant Surgeons employed in Bihar and Orissa has been sanctioned from the 1st April 1917 :—

| Grades.                | Former rate. | Present rate. |
|------------------------|--------------|---------------|
|                        | Rs.          | Rs.           |
| Senior First class ... | 100          | 110           |
| „ Second class ...     | 80           | 95            |
| 1st grade ...          | 65           | 80            |
| 2nd „ ...              | 55           | 70            |
| 3rd „ ...              | 45           | 60            |
| 4th „ ...              | 30           | 50            |

Promotion from one grade to another will continue to be regulated as before. It is hoped that the increase in the initial pay will be greatly appreciated and will attract suitable candidates to the permanent service. So far, however, candidates are still backward in applying for permanent appointments on account, I believe, of the aversion which they have to being deputed to temporary military duty.

Another concession for improving the status of Sub-Assistant Surgeons was sanctioned in 1914. Sub-Assistant Surgeons, with not less than 20 years' service and of very exceptional professional attainments, are now eligible for promotion to the rank of Assistant Surgeons with the pay and prospects attached thereto."

#### PUNJAB HOSPITALS' REPORT.

THE triennial report for the year 1914-16 of the Civil Hospitals of the Punjab is submitted by the Hon'ble Colonel H. Hendley, I.M.S., the Inspector-General. It is full of interesting matter (which more than justifies its extension by  $5\frac{1}{2}$  pages beyond the "authorized limit"). We just quote from the Government resolution as follows :—

"The accommodation for in-patients, consisting as it does of only 4,625 beds, is plainly quite inadequate, although 500 beds in excess of the provision of 1913. It is estimated as the result of local enquiries made by the Inspector-General of Civil Hospitals, that if the provision of medical relief in the provinces is to be proportional in any adequate degree to the needs of the areas and population to be served, 93 new dispensaries are required. It is also recommended that in 40 existing dispensaries Sub-Assistant Surgeons should be replaced by Assistant Surgeons. But even with these contemplated additions there will be on an average no more than one dispensary for every 35,000 persons in the province: and when it is remembered that the radius of influence of each institution is necessarily limited, and that there is no class of scientifically-trained rural practitioner to whom the villager living remote from the nearest dispensary can turn for relief in his sickness, it will be seen that the scope for extension of medical facilities is a vast one. In this connection, and with reference to the remarks in paragraph 21 of the report, His Honour trusts that the Inspector-General will be able to arrange that no inter-departmental difficulties shall be allowed to circumscribe in any way the full sphere of usefulness to the general public of any State special institution.

The department continued to be handicapped by the absence of so many of its officers on military duty. During the year 38 more Sub-Assistant Surgeons and 53 Assistant Surgeons were deputed to service under the Army Department. The response made to the

appeal for Civil Assistant Surgeons for military duty outside India has been most gratifying, no less than 76 having volunteered up to date. But the number of Sub-Assistant Surgeons who have undertaken such service (11 only) remains exceedingly poor, despite the substantial concessions offered them, and the Lieutenant-Governor cannot but deplore the fact that while tens-of-thousands of brave Punjabi soldiers are risking their lives over-seas for their King and country, there should be such reluctance on the part of the Punjab Sub-Assistant Surgeons to volunteer to afford them much needed medical relief.

The province has also furnished a valuable contribution to the military needs of the Empire by supplying 220 trained dressers for service with the army, and His Honour takes this opportunity of acknowledging the patriotic services of the civil and medical officers as well as of the local bodies or associations at Ferozepore, Gnjranwala, Sialkot, Gurdaspur and Amritsar who contributed to produce these excellent results."

The following extracts are from Colonel Hendley's report :—

"There was an increase in the number of enteric fever cases. I do not think this indicates any increased incidence of the disease, but rather a better knowledge of the symptoms of the disease and perhaps improved methods of diagnosis. There are great increases shown under diseases of [the ear, eyes and skin, also in the number of ulcers and local injuries. A great proportion of these would, I think, be rightly ascribed to the greater popularity of our dispensaries inducing a larger number of people to come for treatment of the prevalent diseases of the country. The headings themselves embrace so many different diseases that it would be very difficult to point to any condition that may be having any special effect upon the figures. I doubt much, for instance, if in the case of local injuries in the last three years there has been any such change in the conditions under which the people have lived to expose them to greater danger of body, or again whether it would be profitable to look for such in connection with common diseases as ophthalmia, itch, or a condition such as ear-ache.

In view of what has been written recently on tuberculosis, it is interesting to notice that, though a larger number of cases of tuberculous disease has been treated as in-patients, there has been a decrease in out-patients. The one may be due to greater fear of infection by relatives, and the other to more careful diagnosis. I doubt if the decrease noticed in out-patients indicates any lessening in the incidence of the disease."

**Operative Surgery.**—"The total number of operations performed during the triennium exceeds that performed in the previous corresponding period by 66,993. The number performed in 1916 (266,475), while exhibiting an improvement over that in 1914 (260,775), did not come up to the number performed in 1915 (275,506). The decrease in 1916, however, does not indicate that the province has lost in reputation, as the fall is entirely due to fewer minor operations having been performed. The major or selected operations show a steady rise during the three years under review, having increased from 37,048 in 1914 to 40,399 in 1915, and still further to 40,642 in 1916. The patients operated on during the year numbered 259,331, and the deaths 524, giving a death-rate of '20 per cent., the same as in the two preceding years. In the districts of Gurgaon, Karnal, Simla, Kangra, Ferozepore, Sialkot, Jhelum and Muzaffargarh the number of operations performed is higher than that in 1914 and 1915, but the remaining districts show a falling off—some throughout the triennium....."

"In the case of selected operations, the districts returning the largest number are Ferozepore 8,549, Karnal 3,710, Amritsar 2,187, Jullundur 2,177, Shahpur 1,867, Hissar 1,717, and Gurgaon 1,705. Individual institutions, where a large number of selected operations has been done during 1916 and which need special mention, are Moga (6,894), Panipat (1,965), Amritsar Civil Hospital (1,888), Victoria Memorial Hospital, Jullundur (1,244), Mayo Hospital, Lahore (1,225), Bhalwal (1,172), Shahabad (1,093), Gurgaon Civil Hospital (1,050), and Wazirabad (1,005). I would also mention the hospitals at Zira and Mehraj in the Ferozepore district, where there has been a striking increase during the last three years from 40 in 1914 to 323 in 1916 in the case of the former, and from 20 to 259 in the case of the latter. I have to mention Assistant Surgeons Mir Muhammad Ismail at Panipat, Pandit Hari Chand at Wazirabad, Mehta Kewal Kishan at Chiniot, and Lala Ram Lal Talwar at Chakwal for their good surgical work. At Panipat the number of selected operations has risen from 189 in 1914 to 1,965 in 1916, at Wazirabad from 118 to 1,005, at Chiniot from 117 to 576, and at Chakwal from 118 to 536.

Another district which has come very much to the front in surgery during the last two years is Dera Ghazi Khan, and every credit for this must be given to the Civil Surgeon, Sardar Bahadur Diwan Singh, Duggal, for creating a surgical centre, and to Assistant Surgeon Muhammad Din for ably seconding his efforts."

The statement below shows the number of important operations performed in the three years ending 1916 and the preceding triennium:—

| Operations.                                | Total<br>1914-16. | Total<br>1911-13. |
|--|-------------------|-------------------|
| Amputations ... ..                         | 1,977             | 1,757             |
| Operations on the Skull ... ..             | 135               | 125               |
| Cataract Extraction ... ..                 | 46,765            | 41,897            |
| Abscess of Liver ... ..                    | 331               | 273               |
| Lithotrity ... ..                          | 106               | 61                |
| Lithotomy ... ..                           | 765               | 539               |
| Litholapaxy ... ..                         | 5,819             | 5,944             |
| General Abdominal Operations ... ..        | 5,876             | 4,922             |
| Abdominal Gynaecological Operations ... .. | 913               | 696               |
| General Gynaecological Operations ... ..   | 4,533             | 6,257             |

The largest number of operations was for the relief of cataract, and though there was a fall in the number in 1916 as compared with 1915, due no doubt to Lieutenant-Colonel Smith's absence from the province for half the year, the number for the triennium shows a considerable increase (4,868).

Of the 12,272 patients operated upon in 1916, 95 per cent. obtained good vision, against 95 per cent. in 1915 and 95.58 per cent. in 1914.

The operations for stone in the bladder have appreciably increased during the period under report from 2,115 in 1914 to 2,308 in 1915 and to 2,328 in 1916. The Multan and Dera Ghazi Khan districts furnish the largest returns, viz., 247 and 246, respectively, followed by Ferozepore with 191, Jhang with 134, Shahpur with 131, and Sialkot 125. Khan Bahadur Diwan Ali, Civil Surgeon, Multan, performed the largest number, viz., 119. Next to him come Assistant Surgeon Muhammad Din, Dera Ghazi Khan, with 111, and Assistant Surgeon Kewal Kishan Mehta, Chiniot, with 80.

A smaller number of General Abdominal Operations and Operations on the Skull were performed in 1916, as compared with the two previous years; this is probably accounted for by the absence of so many Indian Medical Service Civil Surgeons.

## BOMBAY HEALTH REPORT.

THE report of the Executive Health Officer of Bombay, Dr. Turner, C.I.E., is as usual full of detail and of interesting matter.

It is too detailed for analysis in the space we have at our disposal, so we must content ourselves with extracts only.

The birth-rate in 1916 worked out at 21.6 of the population, and on this Dr. Turner remarks:—

"Besides the factors which influence in common the birth-rate of every community, there are some peculiar to this city:—(1) The fairly well-established custom of sending prospective mothers home to their parents, where the baby has a better chance of life, so that there is in the city a number of children of mothers belonging to, but born outside, the city and therefore not registered; (2) the omission of parents or relatives to register births through ignorance or neglect, so that there is a considerable number of children who have escaped registration."

### The death-rate in Bombay—

"Applying these corrections, the mortality of the city, as based on the available data, works out to (30,576—1,642+4)=28,938, the lowest registered since the appearance of Plague—giving the ratio of 29.54 per 1,000 of the population—the lowest since 1893 (28.16). Such an estimate of the city's mortality is desirable as it marks a greater approximation to the truth than the bare statement of the number of deaths in the community. This approximation would be still closer, but for the absence of any data regarding deaths occurred up-country among the inhabitants of this city; this absence largely accounts for, if it did not also accentuate, the disparity between the factors of inclusion and exclusion; though, as an offset against the possible reduction due to the omission of such deaths, may be mentioned those occurring among the undoubtedly large number who are attracted to the metropolis for various reasons—visitors bent on pleasure or business, vagrants, labourers in search of work, sick persons in search of expert medical advice or treatment and others who come in order to be with their relations; in addition to these, there has been a large influx from the various theatres of war due to Bombay being the chief port of embarkation and arrival of troops, and to its position as the capital of the Presidency and the facilities it offers for the care and comfort of the sick and wounded; these, though not proper units of the population, are counted among them when they happen to die after a stay of more than ten days.

It is, however, not improbable that in normal times these more or less balance each other, and the death-rate is not materially affected by the want of either figure."

**Infantile Mortality.**—"It has been pointed out that poverty, ignorance, neglect and insanitary surroundings are the principal causes of high infant mortality. The problem is large and many-sided, and the social and economic factor is one with which the Health Department can hardly hope to grapple alone with much hope of success. Voluntary effort and private agencies need, therefore, to be enlisted and encouraged. Bombay, with its large population and huge proportion of poor (76 per cent.), offers a very wide field for many such agencies, which can be linked up closely with its sanitary administration as in the cities of the west. In its efforts for sanitary improvement and the reduction of infant mortality, the Health Department is indebted already to two such agencies whose activities run along closely parallel lines, the Bombay Sanitary Association



which has been labouring incessantly for a decade and a half in the task which it has set itself of educating the public in matters of sanitation and hygiene, and the daughter institution of the Lady Willingdon Scheme which has been at work these two years endeavouring to improve the condition of women during confinement and the care of infants.

The Municipal Nurses, and the Health Visitors of the Sanitary Association and the Lady Willingdon Scheme, who are all qualified Midwives, daily visit the localities and chawls inhabited by the poor and help to diffuse and popularize elementary knowledge of the principles of health and hygiene, and carry such knowledge and habit into the homes and lives of the ignorant, giving advice on the prevention of disease and the care and upbringing of infants, and bring to the notice of the authorities unregistered births and unvaccinated children, and cases of sickness; they also find out prospective mothers among the poor and induce them to go to the Maternity Homes provided for them free; and, where such recourse is not sought, attend on the women in their homes, providing them with necessaries in the shape of milk, blanket, charpoy, etc. There are at present three Maternity Homes for the poor—one Municipal, at Bellasis Road, and two under the Lady Willingdon Scheme, of which one is at Parel (opened on 24th March 1916), and the other at Victoria Bunder, Colaba, (opened on 1st September 1916).

An offer of Rs. 5 lakhs for establishing Maternity Homes for the Poor is before a Committee of the Municipal Corporation, and when the Scheme is given effect to and the Homes come to be planted in suitable localities, and when the Maternity Ward of forty-eight beds in the King Edward VII Memorial Hospital comes to be opened, Bombay will be well equipped for the task of reducing infant mortality."

**Plague.**—Of the 1,987 deaths from Plague during the year under report, 1,615 occurred among Hindus of all classes against 480 in 1915; while 247 against 88 in the preceding year were registered among Mussalmans including Negro-Africans. Native Christians contributed 70 and Parsees 43 against 21 and 7 respectively in 1915. The small balance of 12 sums up the deaths among Europeans (6), Jews (5) and Eurasians (1); in the preceding year there was no death from Plague among Europeans, but Eurasians contributed 2 and Jews 1. Buddhists registered no death from the disease as in 1915.

As in previous years, Plague was most fatal to Hindus, who returned the death-rate of 2'35; next Native Christians, with the ratio of 1'69; then Mussalmans (1'37), Parsees ('84), Jews ('75), and Europeans ('50). The lowest death-rate was returned by Eurasians ('23).

The sex distribution of Plague mortality in the year was 1,437 males and 550 females; the ratio per 1,000 of sex population being 2'24 amongst males and 1'62 among females.

The proportion of male deaths to female was 2'6 to 1 in the entire population; among Hindus of all castes 2'5 to 1; 3'4 to 1 among Mussalmans (including Negro-Africans), 1 to 1 among Parsees; but it was 5 to 1 among Europeans, 4 to 1 among Jews, and 2'8 to 1 among Native Christians.

Examining the Plague mortality under the different age-groups, it will be observed that the disease was most fatal to persons between 10 to 30 years of age, as 1,527 or more than 76 per cent. of the deaths occurred among them; 1,103 of these being among males and 424 among females.

**Value of Vaccination.**—The following note is taken from Dr. Choksy's report on the Arthur Road Hospital:—

"The following statement compares the details of case-mortality ratio during the last eight years:—

| Year.    | VACCI-<br>NATED. | CASES.                                  | UNVACCI-<br>NATED. | CASES.                                  |
|----------|------------------|---|--------------------|---|
|          | Number.          | Case-<br>mortality<br>rate per<br>cent. | Number.            | Case-<br>mortality<br>rate per<br>cent. |
| 1909 ... | 226              | 14·1                                    | 187                | 42·2                                    |
| 1910 ... | 399              | 18·0                                    | 286                | 41·9                                    |
| 1911 ... | 202              | 10·8                                    | 138                | 39·8                                    |
| 1912 ... | 426              | 16·9                                    | 231                | 40·5                                    |
| 1913 ... | 132              | 18·1                                    | 71                 | 36·6                                    |
| 1914 ... | 182              | 19·2                                    | 101                | 33·6                                    |
| 1915 ... | 267              | 12·3                                    | 173                | 36·9                                    |
| 1916 ... | 801              | 13·7                                    | 341                | 32·3                                    |

From the foregoing table it will be observed that the lowest mortality rate among the vaccinated was 10·8 per cent. and the highest 19·2 per cent. This variation is due mainly to the proportion of Goan patients computed as vaccinated, though practically their immunity by protection is very low. Among the unvaccinated, the mortality rate ranged between 32·3 per cent. to 42·2 per cent. and was thus more than double that of vaccinated cases. During one year it was more than treble, and in another more than quadruple. In this connection it has to be noted that all the vaccinated patients had undergone but one vaccination in infancy and the number of those re-vaccinated was but infinitesimal."

Dr. Choksy is always a hopeful therapist and the following note sums up his views on new methods of treating plague by drugs:—

"A few observations were made to treat plague with colloidal preparations of mercury and silver. Owing, however, to the limited amount of the preparations available and the smaller doses employed, the results were scarcely encouraging. Colloidal mercury was used in 12 cases and was administered subcutaneously near the buboes in doses of about 1 c.c. daily from 3 to 4 days after admission. Nine cases died and three recovered. Colloidal silver was similarly used among 4 patients with 3 deaths and 1 recovery. The observations were too limited to allow of any conclusion, but it was noted that the injections hardened the buboes, lessened the pain and checked further increase even in cases that were septicemic that eventually succumbed. On the other hand, the cases that recovered were probably sterile. The effects of the injections were well marked and general and local improvement became manifest after two to three injections. Further observations with the above as also with Colloidal Iodine will be made during the epidemic of 1917. Our present knowledge of the disease, however, forbids any hope of good results accruing from a purely bactericidal treatment, whether with drugs or a bactericidal serum, unless the infection is localised, or an antitoxic serum is combined with such treatment."

## Correspondence.

### SODIUM GYNOCARDATE AND SODIUM MORRHUATE IN TUBERCULAR DISEASE.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In October, 1916 I reported in the *British Medical Journal* having obtained local reactions in leprosy tissues, with breaking down of the acid-fast bacilli, following



intravenous injections of sodium gynocardate, and I then suggested that this line of treatment would be worth trying in tubercular diseases, also due to an acid-fast organism and for which chaulmoogra oil has indeed been recommended by some old writers. During the last few months I have been giving intravenous injections of the drug in lupus and subcutaneous ones in pulmonary phthisis with some evidence of improvement, but the subcutaneous injections are very painful.

With the help of Dr. Sudhamoy Ghosh I have now succeeded in preparing soluble sodium salts of the unsaturated fatty acids of codliver oil—which may conveniently be called sodium morrhuate. They are readily soluble in a 3 per cent. solution and practically painless on subcutaneous injection. In a phthisical case a 1 c.c. dose produced a slight temperature reaction, but half that amount was followed by a fall of temperature and improvement in other respects. The melting point of the fatty acids from which this salt was prepared is 22° C, while intravenously in pigeons its toxicity is not above that of the lowest melting point and least toxic preparation of sodium gynocardate. This new preparation, made from an animal oil, containing a large proportion of the unsaturated fatty acids of a similar nature to those in chaulmoogra oil, is clearly worthy of careful trial in tubercular diseases by the hypodermic method. In view, however, of the local and febrile reactions sometimes following gynocardate of soda intravenously in leprosy great caution will be necessary in giving injections of sodium morrhuate into the vein in pulmonary and glandular tubercle especially, lest dissemination of the disease be produced; a point I hope to be able to test experimentally. In view of the immense importance of tubercular diseases all over the world and the limited opportunities I have for testing clinically the new preparation, I have thought it well to record the above observations without delay, as it will take much time and many workers to ascertain if the tubercle bacillus can be successfully dealt with in the human system in a similar manner to that in which the leprosy bacillus has been in some cases at least, as shown in my paper in the October number of the *Indian Journal of Medical Research*. Sodium morrhuate is easily prepared in the same way as sodium gynocardate, as described by Dr. Sudhamoy Ghosh in the April number of the same Journal, only starting with codliver instead of chaulmoogra oil. I am also trying sodium morrhuate in leprosy, especially in cases in which intravenous injections of sodium gynocardate can not be conveniently given.

CALCUTTA;  
4th January, 1918.

Yours, etc.,  
LEONARD ROGERS, M.D.

#### DEVELOPMENT OF THE ROUND WORM.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I have been following with considerable interest the work of Major F. H. Stewart on the Development of *Ascaris lumbricoides* which has appeared in the *British Medical Journal*, *Parasitology* and the *Indian Medical Gazette*. After studying his series of experiments I reached very nearly the same conclusions as are so clearly presented by Colonel Clayton Lane in his article "Ascaris lumbricoides and Coprophagia" (*Indian Medical Gazette*, August, 1917), namely, (1) that the rat does not act as an intermediate host for *A. lumbricoides*, but that the larvæ which are hatched in the rat's intestine simply take the same course in the rat that they would take in their definitive host, and (2) that the larvæ would be found to take the same course in other experimental animals. The latter has been found to be the case by Major Stewart himself at least in so far as the pig is concerned. (*Indian Medical Gazette*, August 17, 1917, page 272).

In Major Stewart's letter in reply to Colonel Lane in the (*Indian Medical Gazette*, October, 1917, page 379), in which he discusses the positive experiments in feeding *Ascaris* eggs he summarily dismisses the work of Grassi, Calandruccio and Lutz as "single experiments in impure surroundings" and therefore subject to question. "Epstein's experiments," he says, "I have not been able to find either in original or summary." It is extremely unfortunate that Major Stewart could not obtain Dr. Epstein's work, as a perusal of it would undoubtedly have led him to give more weight to the experiments of the other Helminthologists whose work he dismisses so brusquely.

Epstein, (*Jahrbuch für Kinderheilk*, 1892, N. F. XXXIII., pages 287–301) administered eggs containing living embryos to three children who had been proven to be free from worms, and had been placed on a carefully chosen diet before the beginning of the experiments. The eggs were fed in syrup on January 28th, 1891. The feces of two of the children, who remained in hospital under the personal control of the author, were examined from time to time and showed no eggs on April 12th of that year. Twelve days later, on April 24th, examinations showed great numbers of eggs of *Ascaris* in the feces of both children. One of the children was treated

with santonin on April 25th, May 23rd, and June 8th, and 22 *Ascaris* were passed. The second child received its first santonin treatment on May 25th and the last on September 18th, and during that time 72 worms were recovered from the feces. The measurements of the worms that were first recovered, that is, 12 weeks after infection were:—females 20 to 23 cm. in length, males 13 to 15 cm. in length. The third child left the hospital on March 28th at which time no eggs had been found in its feces. A subsequent examination on June 20th showed very numerous *Ascaris* eggs in the stool. Epstein further states that he finds only 3.7 per cent. of the children in the city of Prague infected, while the percentage in the country districts is about 52.

Excellent reviews or abstracts of this article may be found in *Centralbl. f. Bakteriöl. u. Parasitenk.*, Jena, 1892, Vol. 11 (22), pp. 703–704.

*Centralbl. f. allg. Path. u. Path. Anast.*, Jena, 1892, Vol. 3 (21), pp. 912–913.

*Amer. Journ. Med. Sci.*, Philadelphia, 1892, Vol. 104 (3), pp. 372–373.

This work brings the number of positive infections by direct feeding up to six, in three of which there can be no question of coincidence.

Lastly, if you will allow it, I will add another case from personal experience which, taken by itself, would be of no value, but taken in conjunction with the previous six cases is, at least, a remarkable "coincidence." I carried on the experiments with *Ascaris* eggs which are summarized in my paper "On the development of the eggs of *Ascaris lumbricoides*" (*Phil. Journ. of Science*, Vol. X, Sec. B, 1915, pp. 19–23), between the months of March and October, 1914. At the beginning of the experiments I had been a resident of the Philippine Islands for seven years and had never had an *Ascaris* infection. It was not my intention to try any direct feeding experiments, but as I was handling large numbers of embryo-containing eggs every day I realized the possibility of accidental infection and made an examination of my stool every two weeks during the experiments and for some time afterwards. At the beginning of the experiments I was free from *Ascaris* and my feces remained free from eggs until October 28th, when large number of eggs were found. After several doses of santonin I succeeded in ridding myself of the infection, and have remained without infection up to the present time. Thus in a residence of nearly 11 years in an *Ascaris* infested country, the only infection with *Ascaris* that I have had was when I was handling the eggs in the laboratory where chance of getting infected from an intermediate host was practically nil.

The foregoing remarks are offered not with any intention of criticising or belittling Major Stewart's excellent work, but simply with the idea of clearing up some of the points of difference in the discussion.

Yours, etc.,  
LAWRENCE D. WHARTON,  
Assistant Professor of Zoology,  
University of the Philippines, Manila, P. I.

6th December, 1917.

#### SOME UNUSUAL METHODS OF DISPOSAL OF EXCRETA IN CAMPS.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—With reference to Major Murison's article (*Indian Medical Gazette*, October, 1917) on the disposal of excreta in camps on service, it might be of interest to record some methods that have been used in East Africa with success and that are not quite usual elsewhere.

1. *Smoke Latrines*.—These were popular amongst the Germans, and perhaps are a German invention. The idea is simple, it is that of cess pit (or cess trench) with several openings for use, and one for the letting down of a smoking wood fire in a perforated kerosine tin, which hangs half way down the pit suspended by wires from a board that closes the opening when the fire is let down. The trench should be at least 8 feet deep, its width and length as circumstances dictate. Six latrine openings 12" x 9" (three on each side of the central fire opening) at intervals of three feet, is about the maximum number that one fire will serve. It is important to keep each opening closed by a board when not in use, so as to prevent the unnecessary escape of smoke. The fire will need renewal twice a day. Beyond that, and care to keep the latrine openings closed, such a latrine needs astonishingly little attention, breeds no flies, keeps surprisingly sweet and clean, and lasts a long time especially if made in porous soil.

2. *Trenching and Burning in Situ*.—Ordinary latrine trenches dug at least two feet deep are used as usual, but instead of being filled in with earth they are at least once daily filled with dry grass and leaves and burnt out. When sweeper labour is scarce and fuel plentiful this makes a good substitute for proper incineration. The burning not

only scorches the faeces presumably killing fly-eggs and larvae, but distinctly helps to keep flies away as the odour of burnt grass seems to be disliked by flies. The early morning, after the first rush to the latrines is over, is the best time to burn out the trenches.

3. *Trenching and Spraying with Sodium Arsenite*.—I have not seen this method used in East Africa, but a friend in the S. A. M. C. has informed me of its exceedingly successful use in a camp in G. S. W. Africa, where previous to its adoption flies were a great curse. Deep trenches were dug. No earth was ever thrown in. The excreta were daily sprayed with a sodium arsenite solution (sodium arsenite 1—2 lbs., sugar 10 lbs., water 1 gallon). Thus flies were killed just when they were most dangerous—after visiting the latrines. Presumably flies did not breed in the arsenicated faeces, or if they did were soon killed after emergence. This plan promises success in other dry climates like that of German South West, and may possibly be equally useful in moist climates. It is a plan to be tried where fuel is scarce.

EAST AFRICA F. F.,  
21st December, 1917.

H. N. KING,  
CAPT., I. M. S.

### THE EFFECT OF RADISHES IN DROPSY.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Dullav Bansulia, a prisoner, fell ill of dysentery by the month of September, and was admitted in the Jail Hospital. He is aged about 40. After a few days he got cured, but some unfavourable sequelæ appeared on him. His face and feet got oedematous. Diuretics and cardiac tonics were administered but to little effect. Gradually his peritoneum was filled up with serous fluid and the extremities got oedematous. All hopes of life were abandoned, and I prescribed a mixture containing digitalis and scoparius followed by jalap powders.

A sufficient quantity of milk was also given him every day. I remarked a slight improvement after a few days, but after a fortnight he was found to palpate on slight movement. I, therefore, replaced stropanthas instead of digitalis. Such treatment went on for about a month but to no effect. Fluids of the body were gradually increasing instead of diminishing a little bit. The patient himself refused to undergo any medical treatment. He earnestly prayed me for a radish plant. First of all, I refused to recommend for the same, though the patient expressed that among his (aboriginal) tribes radish is given to dropsical patients as the only remedy and cure. On his repeated prayers I agreed. I gave him a radish from the garden and wanted to see how he would take it. He cut all the parts of the radish including leaves and washing a while in pure water toasted on a fire for about ten minutes without oil or salt. He said that there is no other process of preparing than this, and he took all with a little rice. Next day he told me that he passed urine several times and in sufficient quantity, and he wanted from me another radish. On this way after three days a marked improvement was noticed. He passed large quantity of urine several times and his bowels were clear. I then began to give him each radish twice daily. On such administration of radish he is all right now. There is no oedema on any part of his body.

I am utterly surprised to see such a marvellous effect by radish, and I earnestly appeal to practitioners to observe such of its effects and kindly report in this Gazette.

KARANJIA DISPENSARY  
(MAYURBHANJ STATE),  
30th December, 1917.

SUKESLOBHON SEN,  
L.M.P.,  
Sub-Asst. Surgeon.

## LITERARY AND THERAPEUTIC NOTICES.

THE first of the new series of *Indian Medical Monographs* about to be published by Messrs. Thacker, Spink & Co., is on DIABETES, and is an attempt to deal with the pathology and treatment of the disease on the most modern lines. The Author is Lieut.-Col. E. E. WATERS, M.D., M.R.C.P., Indian Medical Service. Whilst all recognised methods of treatment are considered, special attention is paid to the new and successful methods enumerated by ALLEN and put into practice by JOSLIN, LEYTON, and CAMMIDGE. These methods have been successfully used in India for Europeans and Indians, and full dietaries are given for patients of different nationalities and religions. The latest tests for urinary sugar are described and illustrated, whilst the BENEDICT-CAMMIDGE method of exterminating blood sugar is given in full detail.

The publishers confidently anticipate that this first of the series of *Clinical Handbooks from the Tropical Stand-*

point will prove as popular as did the two little Handbooks on "PRACTICAL MIDWIFERY" and "CLINICAL METHODS" by Lieut.-Col. G. T. BIRDWOOD, both of which were published with similar aims and have been highly popular and successful books.

The Anglo-French Drug Co. send us a sample tube of Antigen, a simplified process according to the Lalaple method for the sero-diagnosis of syphilis.

The same firm's preparations of Galy Hectine, Cuprase and Iodeol and Iodargol are now well-known.

Skippers & Co., Calcutta, have upon the market an entirely British disinfectant called CELTOL, which contain chemically pure Cresol.

N. Powell & Co.'s aseptic hospital furniture is well-known to our readers. Their address is Bombay.

## Service Notes.

### THE NEW YEAR HONOURS LIST.

THE names of the following medical men appeared in the Honours list, published in "Gazette of India," 1st January, 1918:—

C. I. E.

Lieutenant-Colonel B. J. Singh, I.M.S., I. G. of Prisons, B. & O.

Bevet-Colonel H. F. Cleveland, I.M.S., Deputy Director-General.

Lieutenant-Colonel W. B. Lane, I.M.S., I. G. of Prisons, C. P., and now in charge of Penal Labour Corps in Mesopotamia.

Lieutenant-Colonel Henry Smith, I.M.S., of 'Cataract' fame.

Dr. Kedar Nath Das, Campbell Medical School, Sealdah.

K. I. H. GOLD MEDAL.

Dr. Ernest Neve, Kashmir.

RAI BAHADUR.

Babu C. K. Chakravarti, Civil Surgeon, B. & O.

L. N. Chaudhuri, L.M. & S., Hon. Assistant Surgeon to the Viceroy.

Rai Sahib-Surju Prasad Tewari, Indore.

KHAN SAHIB.

Muhammad Jamaluddin, Senior Sub-Assistant Surgeon, Madras.

Munshi Khudadad Khan, Lahore.

Maulvi Mir Abdul Bari, Gaya.

Mr. S. R. Masalawala, State Surgeon, Bhopal.

Shaik Miran Shaik Rahim, 1st Class Senior Assistant Surgeon.

Nurul Hussain, 1st Class Senior Assistant Surgeon.

RAI SAHIB.

Sub-Assistant Surgeon, Bhagwan Sahai Singh, Dehra Dun.

Ditto Gopal Chandra Barman, Rajmehal.

Ditto Gokul Chandra Chatterjee, Angul.

Ditto Ganpat Rai, Gilgit.

RAO SAHIB.

Vellore G. Ragu Mudaliar, Bengal.

Assistant Surgeon Thakur Partab Singh, Bharatpur.

Sub-Assistant Surgeon Gangaram Hariba Dhiude, I.S.M.D.

S. Sivandalingam Pillai, Medical Store Depot, Madras.

2ND CLASS ORDER OF BRITISH INDIA.

With title of Bahadur.

Senior Sub-Assistant Surgeon Kishan Chand.

Do. do. Gauri Shanker, I.O.M.

INDIAN DISTINGUISHED SERVICE MEDAL.

Sub-Assistant Surgeon Ghulam Haidar.

Ditto Abdul Majid.

Lance-Havildar Besakhi, A. B. Corps.

Sub-Assistant Surgeon Chintaman Gopal Gogate.

Bearer Data Din, A. B. Corps.

Naik Mangta, A. B. Corps.

Bearer Sonoo, A. B. Corps.

Bearer Lam Lal, A. B. Corps.

Sub-Assistant Surgeon Wahidar Khan.

MERITORIOUS SERVICE MEDAL.

Indian Subordinate Medical Department.

No. 1359, 3rd Class Sub-Assistant Surgeon Birendra Nath Das.

No. 973, 1st Class Sub-Assistant Surgeon Brindaban.

No. 830, 1st Class Sub-Assistant Surgeon Ghans Mohammod.  
 No. 361, 2nd Class Sub-Assistant Surgeon Harishchandra-  
 rao Govindrao Shirke.  
 No. 1150, 1st Class Sub-Assistant Surgeon Jit Singh.  
 No. 829, 1st Class Sub-Assistant Surgeon Lachman Dass.  
 No. 263, 1st Class Sub-Assistant Surgeon Mohan Lal  
 Nagesar Shinkal.  
 No. 1193, 2nd Class Sub Assistant Surgeon Mul Singh.  
 No. 839, 1st Class Sub-Assistant Surgeon Muhammad Amir.  
 No. 1224, 2nd Class Sub-Assistant Surgeon Muhammad  
 Hussain.  
 No. 1094, 1st Class Sub-Assistant Surgeon Ramditta Mall.  
 No. 321, 1st Class Sub-Assistant Surgeon Ram Krishna  
 Anant Parab.  
 No. 1410, 2nd Class Sub Assistant Surgeon V. Venkatara-  
 mayya.  
 No. 852, 1st Class Sub-Assistant Surgeon Wahidyar Khan.

#### Army Bearer Corps.

No. 3139, Lance-Havildar Bara Singh.  
 No. 6995, Dholy Bearer Dharmaji.  
 No. 9514, Naik Doraswamy.  
 No. 7003, Lance-Havildar Dnekechore.  
 No. 1578, Bearer Ghaur.  
 No. 18365, Dholy Bearer Jainti Chetri.  
 No. 304, Naik Juggoo.  
 No. 1046, Bearer Kishen Bahadur.  
 No. 8051, Bearer Mangrey.  
 No. 7054, Naik Misi.  
 No. 8681, Bearer Purnan.  
 No. 6065, Lance-Havildar Ramsarup.

The Hon'ble Surgeon-General W. B. Bannerman, C.S.I.,

Born—6th July, 1858.  
 Surgn.-Maj.—29th Sep-  
 tember, 1895.  
 Lient.-Col.—29th Sep-  
 tember, 1903  
 Brevet-Col.—1st January,  
 1911.  
 Surgn.-Genl.—26th July,  
 1911.  
 King's Hon. Physn—  
 13th August, 1913.

R.H.P., M.D., D.Sc., I.M.S., entered  
 the Indian Medical Service on  
 29th September, 1882, and arrived  
 in India on 3rd May, 1881. He  
 was on general duty and in medi-  
 cal charge of various regiments  
 quartered in the following Military  
 Stations successively, viz.,  
 Secunderabad, Baluchistan, Tri-  
 chinopoly, Mandalay, Madras,  
 Berhampur, Samalpur, and  
 Cuttack until he was transferred

to the Civil Department on 1st July, 1891. After a  
 brief period of service as District Surgeon and Superin-  
 tendent of Jail at Mangalore, he was appointed in 1893  
 as Inspector of Vaccination and Deputy Sanitary Com-  
 missioner, Madras. In 1899 he was deputed to Bombay  
 on plague duty with Dr. Haffkine, and then appointed  
 Superintendent of the Plague Research Laboratory, Bombay.  
 After five months' work in Madras in the interval as  
 Director of the King's Institute of Preventive Medicine at  
 Guindy and Professor of Hygiene and Bacteriology,  
 Medical College, Madras, he went again to Bombay in May,  
 1901 as Director of the Bombay Bacteriological Laboratory,  
 which appointment he held till he was appointed as Surgeon-  
 General with the Government of Madras on the 1st June,  
 1911. Surgeon-General Bannerman's term expired on 26th  
 July, 1916, but in consequence of the conditions brought about  
 by the war he was granted an extension of service up to the  
 6th July, 1918, the date on which he attains the age of sixty  
 years, but had to proceed on leave pending retirement with  
 effect from 3rd January, 1918, on account of ill-health. A  
 large number of improvements have been effected in the  
 Civil Medical Department and in its administration during  
 Surgeon-General Bannerman's tenure of appointment.

To mention a few, the salaries of Civil Surgeons, Civil  
 Assistant Surgeons, Sub-Assistant Surgeons and Compounders  
 and the stipends of civil medical pupils of the Sub-Assistant  
 surgeon class have been raised. The number of Medical  
 Schools in the Presidency in which Sub-Assistant Surgeon  
 pupils are trained has been increased by one and the exist-  
 ing ones have been enlarged so that they can take in a  
 large number of pupils. The curriculum of studies in the  
 Medical Schools have been revised and brought up to modern  
 requirements by the inclusion of such subjects as pathology,  
 histology, etc. Proposals for building an up-to-date General  
 Hospital and Medical College on the Spur Tank site near  
 the South Indian Railway Station at Egmore have been sent  
 up to Government. The special treatment of tuberculosis  
 has been taken in hand by the opening out of an Institute  
 (The King Edward VII Memorial Institute) for the treatment  
 of tubercular cases. Proposals have also been set afoot for  
 the formation of the subordinate Women's Medical Service  
 and the provision of a Medical School for Women in Madras  
 City. To reduce to some extent the abnormal infant  
 mortality which the Madras Presidency in common with other  
 parts of India suffer from the training of Indian midwives  
 in mofussil hospitals has been taken in hand, while proposals  
 have been framed for increasing the output of both English  
 and Vernacular trained nurses both in Madras City and in

mofussil hospitals. The Madras Medical Registration Act  
 has been added to the Statute Book.

The total number of casualties among officers reported  
 during the fourteen days, 10th to 23rd October inclusive, was  
 2,646, which may be tabulated as follows:—

|           |     |     |       |
|-----------|-----|-----|-------|
| Killed    | ... | ... | 785   |
| Died      | ... | ... | 23    |
| Wounded   | ... | ... | 1,637 |
| Missing   | ... | ... | 120   |
| Prisoners | ... | ... | 78    |
| Total     | ... | ... | 2,646 |

Among them are included 46 casualties among medical  
 officers, as well as six among nurses. The very high propor-  
 tion of killed to wounded is remarkable. The names are  
 given below. All, unless otherwise stated, are temporary  
 officers of the R. A. M. C.

**Killed and Died of Wounds:**—Lieutenant-Colonel A. W. F.  
 Sayres (T. F.); Captains K. T. Limbery, T. J. Golding,  
 W. T. Chaning-Pearce, J. P. Charles, M.C., L. Oldershaw  
 (T. F.), J. H. G. Gatchell, M.C., W. D. Reid, N. H. W. Saw,  
 M.C., G. U. Whitehorn Cole, R. Sherman, G. S. Elliott  
 (Australians), J. Davis (Australians), E. T. Gaunt (Regular  
 R. A. M. C.), R. H. Spittal, G. A. Macfarland, A. Oopkins  
 (Australians), Lieutenants R. G. Hill, M.C., and D. S. E.  
 Milligan; Surgeon-Probationer W. C. Holdsworth (R. N. V.  
 R.) in H. M. S. *Begonia*; Staff Nurses A. Climie and M.  
 Milne (both T. F. N. S.); Nurses E. Thompson and D. Coles  
 (both V. A. D.); and Captain D. Annett, L.M.S.S.A., Warwick-  
 shire Regiment.

**Died:**—Major H. E. Dalby (T. F.); Captains J. W.  
 Pettinger and R. Sterling.

**Wounded:**—Staff Surgeon E. L. Atkinson (R. N.); Majors  
 W. B. Crowther (Australians), and J. S. Y. Rogers (T. F.);  
 Captains D. S. Cassidy, W. S. Rees, H. F. Warwick, R.  
 McC. Hill, W. M. Chesney, M.C. (S. R.), A. Morris (T. F.),  
 S. J. Simpson, A. R. Grant, W. F. Wilson, M.C. (T. F.), W.  
 McConnell, A. E. Mackenzie (T. F.), W. F. Young, F. D.  
 Grovo, T. B. Brandon, F. E. Johnson, J. H. Morris-Jones,  
 H. L. Flint, A. Nelson (New Zealand), J. C. Watt (East  
 Africa), D. A. R. Haddon, M. R. Finlayson (Australians),  
 J. Tate, E. H. Griffin, W. L. Graham (T. F.), W. E. Halli-  
 nan, R. F. Walker; Lieutenants R. O. Rogers, G. S. Law-  
 rence; Staff Nurses C. A. Davidson (T. F.), F. E. McKellar  
 (T. F.)

**Prisoner of War:**—Lieutenant-Colonel C. S. Williamson  
 (T. F.)

Captain Wilfrid Thomas Chaning-Pearce, R.A.M.C., was  
 killed in action on 1st October, 1917. He was the third son  
 of Dr. J. Chaning-Pearce, of Montaigne House, Ramsgate,  
 and was educated at Cambridge, where he graduated as B.A.,  
 and also in 1913, as M.B. and B.C. and at Grey's Hospital,  
 taking the M.R.C.S. and L.R.C.P., London, in 1911,  
 after holding the posts of Obstetric Resident and House  
 Surgeon at Grey's, of House Surgeon of the West London  
 Hospital, and of the Croydon General Hospital, he took a  
 temporary commission as Lieutenant in the R.A.M.C. on 5th  
 October, 1914, and was promoted to Captain on completion  
 of a year's service. He was gazetted with the Military Cross  
 on 28th September, 1917.

Captain Kenneth Thomas Limbery, R.A.M.C., was reported  
 as killed in action in the casualty list published on 11th  
 October, 1917. He was educated at St. Thomas' Hospital,  
 took the M.R.C.S. and L.R.C.P., London, in 1916, and  
 immediately afterwards entered the R.A.M.C. as a  
 temporary Lieutenant being promoted to Captain after a  
 year's service.

Captain Thomas James Golding, R.A.M.C., was reported as  
 killed in action in the casualty list published on 10th October,  
 1917. He qualified as L.R.C.P. and L.R.C.S. in 1906,  
 after which he went into practice at Cork, till he joined the  
 R.A.M.C. in 1916, and was promoted to Captain after a year's  
 service.

Captain James Wilson Pettinger, R.A.M.C., died of  
 pneumonia at the Military Hospital, Aldershot, on 6th Octo-  
 ber, 1917, aged 43. He was the son of the late Dr. George W.  
 Pettinger, of Manchester, and was educated at Cambridge,  
 where he graduated as B.A. in 1896, and as M.B. and B.C. in  
 1902, and at St. George's Hospital, also taking the M.R.C.S.  
 and L.R.C.P., London, in 1899. After acting as House  
 Physician, House Surgeon, and Assistant Surgical Registrar  
 at St. George's, he went into practice at Kingsbridge, South  
 Devon where he was honorary medical officer to the Kings-  
 bridge and District College Hospital. He took a temporary  
 commission in the R.A.M.C. last year, and was promoted to  
 Captain after a year's service.

Captain John James Percival Charles, R.A.M.C., died on  
 6th October, 1917 of wounds received on 31st July. He was  
 the son of the late Professor Charles, M.D., of Queen's  
 University, Cork, and was educated at Cork and at Edin-  
 burgh University, where he graduated as M.B. and Ch.B.

in 1903. After acting as House Surgeon of the London Lock Hospital and as House Physician of the Norfolk and Norwich Hospital at Norwich, he went into practice at Swanage. He took a temporary commission as Lieutenant in the R.A.M.C. on 1st September, 1914, and was promoted to Captain on completion of a year's service.

The casualty list published on 12th October, 1917, contains the names of four nurses killed, presumably by enemy aircraft: Sister M. Milne and Staff Nurse A. Climie, both of the Territorial Force Nursing Service, and Miss E. Thompson and Miss D. Coles, both V. A. D. Nurses.

Colonel James Hyslop, D.S.O., late R.A.M.C., died at the sanatorium, Pietermaritzburg, on 5th October, 1917. He was the son of the late Thomas Hyslop, of Woodpark, Kirkcaldy, brightshire, and was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1879; afterwards studying at Berlin, Vienna, and Munich. For the past thirty years he had been Superintendent of the Natal Government Asylum at Pietermaritzburg, and was also President of the Natal Medical Council. He served in the South African War, gaining the Medal and the D.S.O.

Captain Donald Ancutt, Royal Warwickshire Regiment, was killed in action on 9th October, 1917, aged 24. He was educated at Alwyn's School, Dulwich, and at King's College, London, and qualified as L.M.S.S.A. in 1914. He entered the R.A.M.C. special reserve as a Lieutenant in September 1914, but resigned after a year's service, and then enlisted in the Royal Sussex Regiment, later gaining a commission in the Warwicks, and attaining the rank of Captain in July, 1917. He was the son of Mr. Ancutt, of Denmark Hill, London, S.W.

Captain Noel Humphrey Wykeham Saw, M.C., R.A.M.C., was killed in action on 9th October, 1917, aged 25. He was the younger son of Mr. Simmel Saw, of 11, Vanbrugh Park, Blackheath, London, S.E., and was educated at Cheltenham College and at Guy's Hospital, taking the M.R.C.S. and L.R.C.P. London, in 1915. Immediately after he took a commission as Lieutenant in the special reserve of the R.A.M.C. on 10th February, 1915, and was promoted to Captain on completion of a year's service. He gained the Military Cross on 22nd September, 1916. He had served in Gallipoli, in Egypt, and was present at the evacuation of Surla Bay and of Cape Helles.

Captain Leslie Oldershaw, R.A.M.C. (T.F.), attached Manchester Regiment, was reported as having died of wounds in the casualty list published on 15th October, 1917. He was educated at Liverpool University, where he graduated as M.B. and Ch.B. in 1915, joining the R.A.M.C. (T.F.) immediately after qualifying, and being promoted to Captain on completion of a year's service.

Captain William Douglas Reid, M.C., R.A.M.C., was killed in action on 5th October, 1917, aged 30. He was the eldest son of the late John Reid, of Blenheim, New Zealand, and was educated in New Zealand and at Edinburgh University, where he graduated as M.B. and Ch.B. in 1910. He took a temporary commission as Lieutenant in the R.A.M.C. in the first month of the war on 2nd August, 1914, and became Captain a year later. He was awarded the Military Cross on 3rd March, 1917.

Captain James Harcourt Cecil Gatchell, R.A.M.C., was reported as killed in action in the casualty list published on 16th October, 1917. He was a native of Dunmanagh, County Tyrone, and was educated in Dublin, qualifying as L.A.H. in 1912. He was attached to the Royal Sussex Regiment when killed.

Captain Eric Thomas Gaunt, R.A.M.C., was killed in action on 9th October, 1917, aged 33. He was the second son of J. P. Gaunt, M.R.C.S., late of Alrechurch, Worcestershire; and was educated at King Edward's School, Birmingham, and at the University of that city, where he graduated as M.B. and Ch.B. in 1908. After acting as House Physician, Assistant House Surgeon, and House Surgeon of the General Hospital, Birmingham, and as Resident Obstetric Assistant at Queen's Hospital, Birmingham, he entered the R.A.M.C. as Lieutenant on 28th January, 1910, becoming Captain on 28th July, 1913. When the war began he was stationed at Malta, and went to the front in 1915.

Lieutenant Reginald Gordon Hill, M.C., R.A.M.C., attached Coldstream Guards, was killed in action on 11th October, 1917. He was the son of G. W. Hill, of Westhill, Highgate, and was educated at St. Bartholomew's Hospital, where he gained the Junior Entrance Scholarship in 1906, the Junior Scholarship in 1907, and the Treasurer's Prize for Anatomy in 1907. He took the M.R.C.S. and L.R.C.P. London, in 1911, and the M.B. and Ch.B. London, in 1913. After qualifying he acted as Senior House Physician at Barts, and as House Surgeon of the Great Northern Central Hospital, and served as First Surgeon of the British Red Crescent Hospital in the Turco-Italian War of 1912. He had taken a temporary commission in the R.A.M.C. within the last year, and was awarded the Military Cross so recently as 26th September, 1917.

Captain Arthur George Whitehorn-Cole, R.A.M.C., was reported as killed in action in the casualty list published on

17th October, 1917. He was educated at St. Mary's Hospital, and took the M.R.C.S. and L.R.C.P. London, in 1916; after serving as Chemical Assistant at St. Mark's Hospital for cancer and other diseases of the rectum, and at the Cancer Hospital, London; he went to France as Senior Surgeon to a base hospital, and subsequently took a temporary commission in the R.A.M.C.

Captain G. S. Elliott, Australian Army Medical Corps, was reported as killed in action in the casualty list published on 18th October, 1917.

Surgeon Probationer W. C. Hohlsworth, R.N.V.R., was reported as missing, feared killed, in the casualty list published on 27th October, 1917. He was lost in the mine sweeping sloop H. M. S. *Bagonia*.

Captain Reginald Sherman, R.A.M.C., died of wounds on 10th October, 1917, aged 30, while serving with a field ambulance. He was the eldest son of the late Arthur Sherman of 2, Gloucester Place, Greenwich, and was educated at Charterhouse, at St. Bartholomew's Hospital, taking the M. R. C. S. and L. R. C. P. London, in 1912, and at Cains College, Cambridge, where he graduated as M. B. and B. C. in 1911. After acting as extern Midwifery Assistant, as House Physician, and as Resident Anaesthetist at Barts, he took a temporary commission as Lieutenant in the R. A. M. C. on 7th December, 1914, and was promoted to Captain on completion of a year's service.

Lieutenant Colonel Alexander Ward Fortescue Sayras, R.A.M.C. (T. F.), died on 10th October, 1917, of wounds received on 17th July. He was born in 1867, the son of the Revd. Edward Sayras, Rector of Cold Ashton, near Bath, and was educated at Sherborne, and at St. Thomas' Hospital, taking the M. R. C. S. and L. R. C. P. London, in 1894, the D. P. H. of the London College in 1902, and the M. D. Brussels, in 1896. After acting as clinical assistant in the ear department at St. Thomas', as resident clinical assistant at Bethlem Royal Hospital, and as Assistant House Surgeon of the South Devon and East Cornwall Hospital, Plymouth, he practised at Wincanton, at Woodside in Essex, and at Exeter, in succession, and finally became tuberculosis officer of Stonehouse district to the Devon County Council. For many years he had held a commission in the 1st Wessex Field Ambulance, R. A. M. C. (T. F.), and attained the rank of Major on 22nd March, 1912.

Captain Robert Sterling, R.A.M.C., died in a nursing house on 16th October, 1917, aged 58. He was educated at Durham University, where he graduated as B. A. in 1887, as M. B. and Ch.B. in 1892, and as M. A. in 1902. He had served for 24 years as a missionary under the Church Missionary Society at Gaza, in Palestine, and was an honorary canon of the Collegiate Church of St. George in Jerusalem. When his work in Palestine was ended by the war, he took a temporary commission as Lieutenant in the R. A. M. C., and became Captain after a year's service.

Major Herbert Ernest Dalby, R.A.M.C., died at Basra, in Mesopotamia, on 15th October, 1917, while serving in command of the hospital ship *Assaya*, aged 49. He was the son of the late Dr. Dalby, of Torquay, and was educated at Charing Cross Hospital, taking the L. S. A. in 1899, and the L. M. S. A. in 1907. He was in practice at St. Mary's Church, Torquay, where he was Honorary Physician to the Children's Hospital. He had for several years past held a commission in the special reserve of the R. A. M. C., in which he attained the rank of Major on 28th March, 1912.

Lieutenant Donald Samuel Eccles Milligan, R.A.M.C., was recently killed in action on 14th October, 1917, aged 25. He was the second son of Dr. Milligan, of Lytham, near Blackpool, and was educated at St. Thomas' Hospital, taking the M. R. C. S. and L. R. C. P. London, in 1915. After acting as casualty officer at St. Thomas' Hospital, he took a temporary commission in the R. A. M. C. He was attached to the Worcestershire Regiment, and had just dressed a wounded man on a stretcher in a trench, when he stood up, and was instantaneously killed by a shell. He went to France last February.

Captain Robert Haig Spittah, R.A.M.C., was reported as killed in action in the casualty list published on 20th October, 1917. He was educated at Aberdeen University, where he acted as junior demonstrator of anatomy, and graduated as M. B. and Ch.B. in 1915. After practising at Whaley Bridge, and at Denton, in Manchester, he settled at South Bank, Yorkshire. He took a temporary commission in the R. A. M. C. on 10th October, 1914, and was promoted to Captain after a year's service. He received the Serbian Order of St. Sava, 5th Class, in May, 1916.

Captain Odo Hopkins, Australian Army Medical Corps, was recently killed by a shell. He was the son of Dr. George Herbert Hopkins, of Brisbane, Queensland.

Captain George Adams Macfarland, R.A.M.C., died in hospital in London on 17th October, 1917, of septic pneumonia, following wounds received on 20th August. He was the only son of the late Revd. George Macfarland of Belfast, and was educated at Belfast, Dublin, and Edinburgh,



taking the Scottish triple qualification in 1903. In the early part of the war he was Resident Surgeon of the County of London War Hospital, Epsom.

Captain James Daire, Australian Army Medical Corps, was killed in action on 6th October, 1917. He was the second son of the late John Daire of Edinburgh, and was educated at Edinburgh University, where he graduated as M. B. and Ch. B. in 1909. After acting as House Surgeon of Peterborough Infirmary, he went to Australia, where he was Medical Officer of the District Hospital, Jerilder, till he joined the Australian Imperial Forces.

Lieutenant-Colonel Henry Augustus Fitzroy Nailer, Madras Medical Service, retired, died at Bedford on 12th October, 1917. He was educated at the Universities of Madras, where he graduated as M. B. in 1874, and of Edinburgh, and took the L. R. C. P. and L. R. C. S. Edinburgh, in 1875. Entering the I. M. S. as Surgeon on 31st March, 1877, he became Surgeon-Major on 31st March, 1889, Surgeon Lieutenant-Colonel on 31st March, 1897, and retired on 20th October, 1903. The *Army Lists* assign him no war service.

#### PENSIONS FOR DEPENDANTS OF I. M. S. OFFICERS.

THE India Office announces that the provisions of Part II of the Royal Pensions Warrant of August 1st, 1917, apply to the pensions of the widows, children, or dependants of officers of the Indian Army, Indian Medical Service (permanent and temporary), and Indian Army Reserve of Officers, deceased in consequence of the present war. The benefits of the Royal Warrant, where it differs from previous warrants, have effect from April 1st, 1917. Pensions granted to widows and children of officers of the above classes have been, or will be, reviewed by the India Office, and, where necessary, readjusted without application, but in the following cases application is necessary: (1) Claims to education allowance; (2) claims of relatives of deceased officers other than widows and children. The application should bear a reference to any previous correspondence, and should be made in writing to the Under-Secretary of State for India, Military Department, India Office, London, S. W. 1.

In his despatch of 23rd July, 1917, published belated in *Gazette of India*, December, 15th, 1917, the Commander-in-Chief mentions the names of the following medical men for good work:—

#### IN THE ADEN OPERATIONS.

Major C. E. W. S. Fawcett, R.A.M.C.  
Lieutenant B. S. Dhondy, I.M.S.  
Captain J. B. Hanafin, I.M.S.  
Sub-Asst. Surgeon S. V. Sathe.  
Sub-Asst. Surgeon S. R. Sen.

#### IN SOUTH EAST PERSIA.

Rahman, Capt. M. A., I.M.S.  
Marshall, Asst. Surgeon J. W.  
Arjunlal Gagabhai Jotania, 3rd Class Sub-Assistant Surgn., Bombay.  
Karam Bayeram, 3rd Class Sub-Asst. Surgeon, T. B.  
Lambodar Misra, 2nd Class Sub-Asst. Surgeon.  
Mirza Mohammed Beg, Khan Bahadur, 1st Class Sub-Assistant Surgeon.

OFFICIATING CIVIL SURGEON BABU B. C. DAS GUPTA made over charge of the Rangpur Jail to Civil Surgeon Rai Hari Nath Ghose Babadur on the afternoon of the 30th November, 1917.

MAJOR G. HUTCHESON, I.M.S., Civil Surgeon, on return from leave, is posted to Moradabad.

In modification of the Education Department Notification No. 255, dated the 1st June, 1917, Major F. Norman White, C.I.E., M.D., I.M.S., Assistant Director-General, Indian Medical Service (Sanitary), is appointed to officiate as Sanitary Commissioner with the Government of India in addition to his own duties with effect from the 1st December, 1917, and until further orders.

THE following temporary Assistant Surgeons are appointed provisionally Substantive Assistant Surgeons of the 3rd grade with effect from the dates specified against their names:—  
Nanubhai Bhupatram Munzmdar, M.B., B.S., 1st April, 1917.  
Girdharlal Motilal Kothari, L.M. & S., 29th June, 1917.

THE services of the following Civil Assistant Surgeons have been placed at the disposal of the Government of India for

employment on military duty with effect from the dates specified against their names:—

Assistant Surgeons M. G. Oka, L.M. & S., 30th August, 1917; A. D'Silva, L.M. & S., 9th September, 1917; V. R. Masurkar, L.M. & S., 30th September, 1917; G. B. Advani, M.B., B.S., 7th September, 1917; D. S. Dhavle, L.M. & S., 9th September, 1917; Nathan Elijah, L.M. & S., 7th September, 1917; Y. P. Gupta, M.B., B.S., 10th October, 1917; D. M. Moolky, M.B., B.S., 4th September, 1917; S. V. Trivedi, L.M. & S., 6th September, 1917; B. R. Malkani, M.B., B.S., 19th October, 1917.

THE services of Lieutenant Colonel C. H. L. Meyer, I.M.S. (retired), are replaced at the disposal of the Government of Bombay with effect from the date on which he is relieved of his military duties.

IN supersession of Home Department Notification No. 406, dated the 4th October, 1917, the services of Lieutenant-Colonel C. H. James, C.I.E., I.M.S., are placed temporarily at the disposal of the Chief Commissioner of Delhi with effect from the afternoon of the 29th September, 1917.

DR. W. S. ROBERTSON, M.B., Ch.B., is appointed to be Professor of Operative Surgery, King Edward Medical College, Lahore, with effect from the 23rd October, 1917, until further orders.

LIEUTENANT COLONEL R. BIRD, M.V.O., C.I.E., M.D., F.R.C.S., V.H.S., I.M.S., Professor of Surgery, Medical College, Calcutta, and Surgeon to the College Hospital, is granted privilege leave for three months, with furlough for nine months in continuation, with effect from the date on which he makes over charge of his duties, owing to his health having broken down.

Lieutenant-Colonel C. R. Stevens, M.D., F.R.C.S., I.M.S., is appointed to officiate as Professor of Surgery, Medical College, Calcutta, and Surgeon to the College Hospital, during the absence on leave of Lieutenant-Colonel R. Bird, M.V.O., C.I.E., M.D., F.R.C.S., V.H.S., I.M.S., until further orders.

A LIST of 326 Sub-Assistant Surgeons employed on temporary military duties is published in *Gazette of India* (29th December 1917), as granted military rank as Jemadars and Warrant Officers. (I. A. R., Vol. VI, para. 16.)

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, I. M. S., with effect from the dates specified:—

Jaideva Varma, 30th June, 1917; Ram Narain Sud, 1st July, 1917; Umrao Singh Gupta, 29th July, 1917; Bankim Chandra Sengupta, 21st August, 1917; Jogendra Nath Basu, 27th August, 1917; Havendra Nath Bose, 27th August, 1917; Sobha Ram Puri, 4th September, 1917; Shankar Narain Dojiba Gore, 24th September, 1917; Joseph Lawrence Saldanha, 25th September, 1917; Chiman Lal Dhinra, 30th September, 1917; Ram Nath Sharma, 8th October, 1917; Ganga Bishan, 11th October, 1917; Yashvant Prabhakar Gupta, 16th October, 1917; Jiwan Mal Chopra, 19th October, 1917; Padamji Ardeshir Dastoor, 21st October, 1917; Kandathil Eapen Pothan, 21st October, 1917; Pattathil Balakrishna Menon, 27th October, 1917; Muhammad Sulaiman Ashraf, 31st October, 1917; Kandathil Mathulla Mathew, 8th November, 1917; Chakkingal Krishna Menon, 13th November, 1917; Govindarajapuram Rama Pattar Parasuram, 19th November, 1917; Daivasi Kawany Iyer Kanka Sabhesan, 22nd November, 1917; Suresh Chandra Banerji, 23rd November, 1917; and Subbaraya Kumara-swami Pillai, 25th November, 1917.

THE undermentioned officers have been appointed permanently to the Indian Medical Service as Lieutenants by the Right Hon'ble the Secretary of State for India, subject to His Majesty's approval. Their commissions will bear dates as noted against their names:—

Basil Cedric Ashton, M.B. [Lieutenant, R.A.M.C. (T. C.)], 23rd January, 1917; Joseph Godfrey Bird, M.B., 23rd January, 1917; William Maurice Orombie, M.B. [Lieutenant, R.A.M.C. (T. C.)], 23rd January, 1917; Robert Hay, M.B. [Captain, R.A.M.C. (S. R.)], 23rd January, 1917; George Arthur Stuart Ramsay, M.D. (Captain, C.A.M.C.), 23rd January, 1917; George Shanks, M.D. (Captain, C.A.M.C.), 23rd January, 1917; Norman Briggs [Captain, R.A.M.C. (T. C.)], 8th August, 1917; and Philip Verdon [Captain, R.A.M.C. (T. C.)], 8th August, 1917.



SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants with effect from the dates specified :—

Suraj Narayan Kapur, 20th July, 1917; Samuel Nowman Mukand, 29th August, 1917; Jugul Kishore Sharma, 26th November, 1917; Satindra Chandra Basu, 28th November, 1917; and Padmanabha Rangappa Bhandarkar, 2nd December, 1917.

CAPTAIN V. B. GREEN ARMYTAGE, M.D., I.M.S., Senior Medical Officer, Indian Medical Service, Shillong, was appointed to officiate, in addition to his own duties, as Civil Surgeon, Khasi and Jaintia Hills, during the absence on leave of Dr. H. Gordon Roberts.

THE following gentlemen have been appointed as temporary Civil Assistant Surgeons with effect from the dates specified against their names :—

Mr. G. R. Padbidri, M.B., B.S., 17th November, 1917.  
Mr. G. B. Mankad, M.B., B.S., 29th November, 1917.

THE services of Assistant Surgeon K. K. Mankodi, L.M. & S., have been placed at the disposal of the Government of India for employment on military duty with effect from the 25th November, 1917.

A Bar to the Distinguished Conduct Medal has been awarded to 3rd grade Assistant Surgeon R. H. F. Parkinson, I.S.M.D.

The Distinguished Service Medal has been awarded to Subedar Assistant Surgeon Indar Singh.

THE Government of India have had under consideration the question of the eligibility of retired officers of the Indian Medical Service, who have been re-employed, for the following concessions when they are permitted to resign on account of ill-health or private reasons :—

- Free passage back to place of residence.
- Continuance for four weeks of the pay of the appointment last held.
- Gratuity of 31 days' pay for each year or part of a year of re-employed service, provided such service is not pensionable.

With reference thereto, with the approval of the Right Hon'ble the Secretary of State for India, the Government of India have decided that concessions (a) and (b) will be admissible to all re-employed retired officers of the Indian Medical Service permitted to resign whether on account of ill-health or for private reasons. Those resigning for private reasons will not be eligible for concession (c) which will only be admissible to officers permitted to resign on account of ill-health, provided that, if the disability which resulted in resignation of service was not caused in and by the performance of military duty, not less than six months' service on full pay has been rendered.

The extra expenditure on account of (c) should be debited to His Majesty's Government through the Central War Controller, and that on account of (b) will be adjusted under the same head of account as the pay of the officer concerned.

THE number of casualties among officers recorded during the fourteen days, 7th to 20th November inclusive, was 2,511, classified as follows :—

|           |     |     |       |
|-----------|-----|-----|-------|
| Killed    | ... | ... | 715   |
| Died ...  | ... | ... | 16    |
| Wounded   | ... | ... | 1,533 |
| Missing   | ... | ... | 155   |
| Prisoners | ... | ... | 42    |
| Total     | ... | ... | 2,511 |

Among them were included 55 casualties to medical officers, besides one medical man killed serving as a combatant and two members of the nursing service wounded. The names are given below, all, unless otherwise noted, are temporary officers of the R. A. M. C.

**Killed or Died of Wounds:**—Captains K. A. MacCuish (Canadians), J. B. Randall, R. A. Ireland (Canadians), E. Phillips (regular R. A. M. C.), J. Fox-Russell, M.C., G. E. Chissell; and Lieutenant-Colonel A. Pye, M.D. (Australian Infantry).

**Died:**—Lieutenant-Colonel W. Graham; Captain H. F. Heslop; Lieutenants G. Taylor, H. F. Ransome, E. S. Baillie (I. S. M. D.), and W. C. Macmillan (I. S. M. D.).

**Wounded:**—Lieutenant-Colonel H. Fulton; Majors N. E. Kirkwood, M.C. (Australians), J. R. Muirhead (Australians), W. Bapty (Canadians); Captains W. R. Addis, M. A. Power, A. E. Huxtable (T. F.), W. P. Jepson (S. R.), D. Macnair

(T. F.), J. F. M. Sloan, M.C., J. Gapp, J. Morris (T. F.), K. H. Stokes, T. J. Kelly, C. Wynne, H. S. Moore, J. H. Fletcher, D.S.O., M.C., J. M. Forsyth, M.C., J. Dunbar, F. P. Jorcelyne, M.C., M. P. Power, A. T. Howard (Australians), J. Morgan (Australians), J. P. Peake (Canadians), H. W. Gush, H. G. Rice, H. F. Dunstan (Canadians), G. D. Eccles, T. G. Featherstonhaugh, W. Harmens, G. Sutherland, O. J. Ellis (Australians), R. M. Thomson (Australians), D. G. Kennard, J. Young; Surgeons W. P. Starforth (R. N.), J. J. Keatley (R. N.); Lieutenants E. H. Good, A. P. Draper, D. W. Anderson, J. A. C. George, M.C., W. H. Orton, J. Avery; and Sisters E. I. Devenish-Mears and M. Stewart (both Q. A. I. M. N. S. R.).

Captain John Beaufray Randall, R.A.M.C., was killed in action on 31st October, 1917, aged 28. He was the younger son of Wyndham Randall, Surgeon of Bridgend, Glamorgan, and was educated at St. Bartholomew's Hospital, taking the B.Sc., London, with honours in physiology in 1911, and the M.B. and B.S., with honours in medicine in 1914; also the M.R.C.S. and L.R.C.P., London, in 1914. He then served as House Surgeon and House Physician at St. George's Hospital. He took a temporary commission as Lieutenant in the R.A.M.C. in 1916, and was promoted to Captain after a year's service.

Lieutenant-Colonel William Graham, R.A.M.C., died from the effect of an accident at Pordsburn Villa, County Down, Ireland, on 5th November, 1917. He was educated at Belfast, and graduated as M.D. of the Royal University, Ireland, in 1882; also studying in London and Paris, and taking the L. R. C. S. Ed. in 1883. After filling the posts of Assistant Medical Superintendent of Belfast District Lunatic Asylum, and of Resident Medical Superintendent of Armagh District Lunatic Asylum, he became Resident Medical Superintendent of the Belfast District Lunatic Asylum, and of the Pordsburn Villa Colony Asylum, Belfast. He held a commission as Lieutenant-Colonel in the R. A. M. C. as head of the Belfast War Hospital.

Lieutenant-Colonel Cecil Robert Arthur Pye, Australian Infantry, was killed in action on 4th October, 1917, aged 27. He was born at Windsor, New South Wales, in 1890, and educated at Sydney University, where he graduated as M. B. and Ch. B., after which he proceeded to Europe for further study. When the war began, he returned to Australia to join the Australian Forces, in which he had held a commission for several years, having attained the rank of Captain on 30th January, 1913. He had served with his Battalion at Gallipoli, and received the D. S. O. on 11th May, 1916.

Captain K. A. MacCuish, Canadian Army Medical Corps, was reported as wounded in the casualty list published on 7th November, 1917, and in that of the following day as having died of his wounds.

Captain Harold Linton Heslop, R.A.M.C., died on service in France in October, 1917. He was educated at Durham University, where he graduated as B. S. 1903, and as M. D. in 1906. After serving as House Surgeon of the Tynemouth Jubilee Infirmary, he went into practice at Sunderland, where he was Honorary Assistant Surgeon to the Children's Hospital. He joined the 7th (Territorial) Battalion of the Durham Light Infantry as Lieutenant and Medical Officer on 11th January, 1910, and was promoted to Captain on 11th January, 1913. He went out with his Battalion early in the war.

Captain George Stephenson Elliott, Australian Army Medical Corps, was killed in action on 26th September, 1917, aged 32. He was the youngest son of the late Mr. Thomas Elliott, of Ballarat, Victoria, and a brother of Brigadier-General H. E. Elliott, D.S.O., C.M.G., Commanding the 15th Infantry Brigade. He was educated at Ballarat College and at Melbourne University, graduated as M. B. and B. S. in March, 1916, and at once joined the R. A. M. C. After serving for a short time in No. 5, Base Hospital, Melbourne, he came to Europe in September, 1916, and was posted as Medical Officer to the 56th Battalion, with which he remained till his death. He had been nominated for a decoration.

Lieutenant Edwin Stirling Baillie, I.S.M.D., died suddenly of heart disease at Lahore on 10th September, 1917. He entered the I. S. M. D. as a hospital apprentice in 1880, passed through the Calcutta Medical College in 1881-84, and attained the rank of Senior Assistant Surgeon and Lieutenant on 2nd November, 1908. He retired on 1st May, 1911, but rejoined for service during the war in 1915, and was posted as Assistant to the Civil Surgeon of Lahore. He served for four years in the Burma War, 1885-89, gaining the medal with two clasps, but had put in most of his service in civil employ in the Punjab.

Captain George Edwin Chissell, R.A.M.C., was reported as killed in action in the casualty list published on the 14th November, 1917. He was educated at Middlesex Hospital, qualified as M. R. C. S. and L. R. C. P., London, in 1916, and immediately entered the R. A. M. C. as a temporary Lieutenant, being promoted to Captain after a year's service.

Captain R. A. Ireland, Canadian Army Medical Corps, was reported as killed in action in the casualty list published on 14th November, 1917.

Captain Edwin Phillips, R.A.M.C., was killed in action on the 6th November, 1917. He was educated in the Newcastle-on-Tyne School of Medicine and at the London Hospital, and graduated as M. B. and B. S. in Durham in 1913; also taking the M. R. C. S. and L. R. C. P., London, in the same year, after acting as Emergency Officer at the London Hospital, and as House Physician of Poplar Hospital, he entered the R. A. M. C. as Lieutenant on 31st July, 1914, and was promoted to Captain on 31st March, 1915.

Lieutenant Herbert Fullarton Ransome, R.A.M.C., died at Queen Mary's Hospital, Whalley, Lancashire, in which he was serving as Surgeon, on 14th November, 1917. He was educated at Avens' College, Manchester, and at St. George's Hospital, and took the M. R. C. S., the L. R. C. P., London, and the L. S. A., in 1892. After acting as Honorary Assistant Medical Officer to the Manchester Hospital for consumption and diseases of the throat, he went into practice at Bowdon, Altrincham, Cheshire, where he was Surgeon to the Altrincham Hospital and Dispensary. He had only recently joined the R. A. M. C. as a temporary Lieutenant.

Captain John Fox Russel, M.C., R.A.M.C., (T.F.), was killed in action on 6th November, 1917. He was the eldest son of W. Fox Russell, of Holyhead, and was educated at the Middlesex Hospital, taking the M. R. C. S. and the L. M. S. S. A. in 1916. For some years before the war he had held a commission in the 6th (Carnarvonshire and Anglesey, Territorial) Battalion of the Royal Welch Fusiliers, in which he attained the rank of Captain on 27th January, 1915. On qualifying, he transferred to the R. A. M. C., and after serving for some time as medical officer to a Brigade of Field Artillery, was transferred in the same capacity to his old regiment. He had recently received the Military Cross for gallantry in the field.

THE total number of casualties among officers reported during the fourteen days, 2nd November to 4th December inclusive, was 2,913, as follows:—

|           |     |     |       |
|-----------|-----|-----|-------|
| Killed    | ... | ... | 561   |
| Died      | ... | ... | 28    |
| Wounded   | ... | ... | 1,589 |
| Missing   | ... | ... | 74    |
| Prisoners | ... | ... | 59    |
| Total     | ... | ... | 2,013 |

The number of casualties to medical officers during these two weeks was 47. The names are given below. All, except those otherwise noted, are temporary officers of the R. A. M. C.

**Killed or Died of Wounds.**—Colonel W. W. Hearne, D.S.O. (Australians); Major N. J. Bullen (Australians); W. L. Maclean (Canadians); Captains L. L. McKeever, G. Walker, M.C., G. A. Harvey; Surgeon Probationer, J. L. Nolan, R.N.V.R.

**Died:**—Captain N. J. H. Gavin, M.C.

**Wounded:**—Major M. W. A. Fletcher (Australians); Captains C. F. Backhouse (T.F.), R. T. Carr, J. P. Edmiston, G. Hislop, W. W. Morrison, E. H. Scholesfield (T.F.), D. A. McLeod (Canadians), D. P. Thomas, W. H. Scott, (Canadians), H. W. Whytock (Canadians), D. H. A. Galbraith, W. A. Murphy, W. L. Millett (Australians), E. L. Morgan (Australians), H. P. Caithness, G. M. Foster (Canadians), B. R. Money (Canadians), A. H. Falkner, J. R. Paul, A. Jones, T. R. Carson (Canadians), S. H. Harris, H. F. Woods, A. J. A. McCabe Dallas, C. Hunter, N. McA. Gregg, K. M. Nelson, M.C., T. F. B. Reid, J. R. Barriskill (Australians), S. G. Gibson (Australians), T. E. C. Clarke, M.C. (T.F.), T. Stansfield, J. Alexander, O. B. Davis, M.C.; Lieutenants A. S. Porter (Canadians), V. C. Montgomery, A. Rodd, and M. B. Taylor.

Captain Louis Lawrence McKeever, R.A.M.C., was reported as killed in action in the casualty list published on 22nd November, 1917. He was educated in Dublin and took the L.R.C.P.I. and L.R.C.S.I. in 1914. He joined the R.A.M.C. as a temporary Lieutenant on 14th February, 1915, and was promoted to Captain after a year's service. He was attached to the Royal Scots when killed.

Major W. L. Maclean, Canadian Army Medical Corps, was reported as having died of wounds in the casualty list published on 22nd November, 1917. He graduated at Dalhousie University in 1907, went to France with a Canadian hospital in 1915, and was attached to a British casualty clearing station when killed.

Major N. J. Bullen, Australian Army Medical Corps, was reported as killed in action in the casualty report published on the 23rd November, 1917.

Captain Niel John Hay Gavin, M.A., R.A.M.C., was reported as having died on service in the casualty list published on 23rd November, 1917. He was educated at Edinburgh

University, where he graduated as M.B. and Ch.B. in 1904. After serving as Assistant Medical Officer of the Norfolk County Asylum, and of the West Riding Asylum, at Wakefield, he filled the same appointment in the Three Counties Asylum at Arlesey, Hitchin, Hertfordshire, till he joined the R.A.M.C. as a temporary Lieutenant. He was promoted to Captain after a year's service, and received the Military Cross on 3rd June, 1917.

Colonel W. W. Hearne, Australian Army Medical Corps, was reported killed in action in the casualty list published on 21st November, 1917. He received the D.S.O. as a Lieutenant-Colonel on 4th June, 1917, so must have been only recently promoted.

Surgeon Probationer J. L. Nolan, R.N.V.R., was reported as killed in action in the casualty list published on 21st November, 1917.

Captain Gilbert Aberdeen Harvey, R.A.M.C., died of wounds in a casualty clearing station on 21st November, 1917. He was the eldest son of the late James Harvey, of Adelaide, South Australia, and was educated at Adelaide University, where he graduated as M.B. and Ch.B. in 1911. After serving as House Surgeon and House Physician at the Adelaide Hospital and at the Adelaide Children's Hospital, he came to England and took the post of House Surgeon of the West London Hospital. He joined the special reserve of the R.A.M.C. as a Lieutenant on 19th October, 1914, and was promoted to Captain on completion of a year's service.

Captain Gideon Walker, M.C., R.A.M.C., was killed in action on 27th November, 1917, aged 27, while attached to a Field Ambulance. He was the youngest son of the late Gideon Walker, and was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1912. He took a temporary commission as Lieutenant on 20th September, 1914, and was promoted to Captain after a year's service. He gained the Military Cross on the 14th November, 1916.

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

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## BOOKS, REPORTS, &c., RECEIVED:—

Collected Papers of the Mayo Clinic (1916). W. B. Saunders Co.  
Greene Brook's Diseases of Genito-Urinary Organs (4th Ed.). W. B. Saunders Co.  
Sollman's Manual of Pharmacology. W. B. Saunders Co.  
Komp. Diseases of Stomach and Intestines. (3rd Ed.) W. B. Saunders Co.  
Tinsell and Joll. Nerve Wounds. Baillière, Tindall & Cox.  
P. Mitchell (and others). Army General Hospital Administration. Baillière, Tindall & Cox.  
J. K. Watson. The Venereal Diseases Problem. 2s. 6d. net. Baillière, Tindall & Cox.  
Lawson White. Injuries of the Face and Jaw. 5s. Baillière, Tindall & Cox.  
George Lays. Gonorrhoea and its complications. (2nd Ed.) Price 4s. Baillière, Tindall & Cox.

## LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

Colonel Cleveland, I.M.S. Delhi; Colonel P. Hehir, I.M.S., Rawalpindi; Major C. C. Marison, I.M.S.; Dr. I. Frost, Miraj; Capt. Hughes, I.M.S.; Capt. K. Black, R.A.M.C.; Sir Leonard Rogers, Calcutta; Colonel Denny, I.M.S., Shillong; Capt. W. L. Harnett, I.M.S., Bombay; Major F. P. Connor, I.M.S., Basra; Major E. O. Thurston, I.M.S., Nepal; Capt. N. King, I.M.S., East Africa.

## Original Articles.

### FOUR YEARS' FURTHER EXPERIENCE OF AUTOGENOUS ORAL STREPTOCOCCAL VACCINES IN THE TREATMENT OF SEVENTEEN CASES OF SPRUE.

BY SIR LEONARD ROGERS, M.D., F.R.C.P., F.R.S.,  
LIEUT.-COL., I.M.S.

IN 1914 I reported (*Lancet*, June 6th, 1914) two cases of sprue successfully treated by streptococcal vaccines made from cultures from the sore tongue and mouth. Although both were advanced and chronic cases, the recoveries have now been maintained for at least three years after the treatment ceased, later than which I have not heard from them. During the last four years I have treated a number of further cases with autogenous streptococcal vaccines with most encouraging results, so it appears to be advisable to place my later experience on record, as I find many medical men are unacquainted with this line of treatment. As nearly all my cases have been seen on consulting practice it has not always been possible to obtain their after-histories; but I have made every effort to do so by means of correspondence with the patients or the medical men who sent some of them to me, so the series now recorded is an unselected consecutive one as far as possible. The reports which have reached me from doctors who have injected vaccines made by me have almost invariably been of a favourable nature. Several have written that they regard the treatment as specific, while some pointed to temporary slight reactionary increase of the diarrhoea after an injection, rapidly followed by great improvement, as evidence in favour of such a view of the action of the vaccines.

*Preparation of the Vaccines.*—I mentioned this in my first note, but it may be convenient to repeat the essential points. In the great majority of the cases, cultures were made when the tongue or mouth presented soreness or even small ulcers, but success was sometimes obtained during quiescence of the oral symptoms. Glycerine-agar was always used and commonly a nearly pure culture of streptococci was obtained, while they were nearly always the predominating organisms. I regret I have not been able to find time to work out the cultural characters and classification of the streptococci, but hope some bacteriologist with more leisure will undertake such a study in sprue cases. When uniform surface subcultures had been obtained on sloped glycerine-agar tubes, 5 c.c. of sterile normal saline is added to each tube and heated to 56°C. for one hour, and one-half per cent. carbolic acid added. After mixing

by separating the colonies with a sterile platinum loop it is put up in from  $\frac{1}{2}$  to 2 c.c. doses, the approximate count being about 100 million per c.c., although for some time past I have not considered it necessary to make actual counts, as I found a  $\frac{1}{2}$  c.c. dose was always a safe one to begin with. If the reaction is slight or absent, as is almost always the case, 1 c.c. is given after five days and repeated weekly until there is little or no reaction, when it is increased to  $1\frac{1}{2}$  c.c., and eventually, if necessary, to 2 c.c., ten days interval being allowed between the last-mentioned doses. The injections are nearly painless and usually have to be continued for from three to six months in typical cases, and occasionally for longer with intervals of omissions.

*Drug Treatment.*—The only drug I have used to any material extent in the present series of cases is bismuth salicylate in 15 to 20-grain doses, three times a day at first, but gradually reduced to once a day when the stools fall to one or two daily, and I regard this drug as being of great value in controlling the diarrhoea until the vaccine has had time to exert its specific action. I have not myself used yellow santonine in the following cases, because I wanted to test the vaccine treatment without resource to any drug which is believed by some to exert a specific influence on the disease. Personally, I have no faith in the lasting action of yellow santonine in sprue, because I have seen so many patients relapse on returning to India after having apparently benefited by santonine, plus the change to the favourable climate of Europe; the climate being, I think, the more potent remedy of the two. That yellow santonine does sometimes exert a temporary favourable action in fairly early sprue I do not doubt, but in numerous cases treated with the drug in the tropics at the Calcutta European Hospital, which I analysed some years ago (see chapter on "Sprue" in my book on "Dysenteries"), I never found anything like permanent benefit from the drug. In my former paper on sprue, I attributed some of the benefits in Case 1 to emetine injections; but the patient was also suffering from very severe pyorrhoea, the pus of which has since been shown by Bass and Johns to contain an amoeba susceptible to the action of emetine. In the present series of cases emetine has only occasionally been used in a few of the earlier cases, so the results now reported have not been due to that drug.

*Diet.*—In a few of the worst cases a milk diet was given at first, but under the vaccine treatment I have found it possible to increase the diet more rapidly than can usually be done under other methods, several of my patients having been agreeably surprised at the variety of food I allowed them. Bananas have been given with apparent advantage in some cases, and in several fried liver has been ordered in the hope of

stimulating the functions of that organ; but my experience is not sufficient yet to prove its value. The favourable results obtained have thus not been due to strictness of the diet adopted.

The following are brief notes of the cases beginning with those first treated:—

**CASE 1.**—European male, aged 55. Consulted me in January 1914.

*History of illness.*—Began with diarrhoea in 1904, attributed to "liver." In 1910 was treated in England with yellow santonine with considerable benefit, but he never got rid of his complaint, which increased after each return to India, until in October 1914 his general health was gravely affected and he suffered from giddiness and depression and was very weak.

*Present condition.*—Weak and somewhat anæmic. Mouth showed soreness of the roof and of the tongue. Bowels acted several times daily with loose light-coloured stools.

*Treatment.*—Began in January 1915 with bismuth salicylate by the mouth, and weekly subcutaneous injections of an autogenous oral streptococcal vaccine. Diet not rigorously restricted.

*Progress.*—By March he had improved considerably and left for Australia, continuing the vaccine while away. By June 1915 he passed one normal stool daily, and was absolutely free from all signs of sprue, except slight irritation of the roof of the mouth under palate, and this too disappeared by August. He had now gained considerably in weight and could walk 10 to 12 miles daily without much fatigue. At the commencement of the injections there was a slight increase in the number of the motions for three or four days after each, evidently a reaction, but this decreased and finally ceased as the stools became normal. He now considered himself cured for the first time for eleven years and left off the treatment. He returned to Calcutta in good health for the next cold season and then retired to Australia, and up to the summer of 1917 I heard of his being in good health. While writing his paper, a relative of his has informed me that he is not quite well, but I have heard no particulars.

*Remarks.*—The recovery of this patient under the vaccine treatment, after having suffered for ten years and the failure of prolonged treatment in England, is remarkable. He had no doubt himself as to the benefit being due to the vaccine.

**CASE 2.**—European male, aged about 40. Consulted me in December 1914.

*History of illness.*—Began in August 1913, in Calcutta, with persistent mild diarrhoea, and was treated for six months for "colitis" without benefit. In March 1914, went to England for treatment by specialists, and eventually improved on milk and strawberries, but relapsed when the fruit could not be got and was sent out to India again to avoid the English winter.

*Present condition.*—Mouth very sore, especially during exacerbations of the disease when it was difficult to eat. This feature has been present since December 1913. Stools from three to ten daily of a very light mustard-fawn colour and loose. Weight 9 st. 10 lb.

*Treatment.*—Several injections of emetine first given. Then autogenous oral streptococcus vaccine weekly, and bismuth salicylate by the mouth. Fairly liberal diet given. The stools soon became reduced to two or three a day, more or less formed, and later to one formed stool, but still rather light in colour on stopping the bismuth. The soreness of the mouth also greatly improved. The injections were continued at increasing intervals for six months and then occasionally only. At the end of a year he had regained his normal weight of 12 st. 3 lb.; a gain of two-and-a-half stone. He could now attend

fully to his business (which he had never ceased during the treatment), and play games without fatigue. He went to England in 1916 and remained well that year and throughout 1917, without further treatment.

*Remarks.*—In this case also both health and weight were restored by the vaccine treatment, while doing his work in India after the failure of prolonged and expensive treatment in nursing homes in London.

**CASE 3.**—European male, aged about 50. Consulted me in July 1915.

*History of illness.*—The disease began as hill diarrhoea on a Darjeeling tea estate and developed into sprue.

*Present Condition.*—Weight reduced from 16 st. 4 lb., to 13 st., a loss of over three stone. Tongue raw and sore. Stools large, frothy and light coloured; several daily. Somewhat anæmic.

*Treatment.*—Began early in July bismuth salicylate by the mouth, and weekly injections of autogenous oral streptococcus vaccine commenced. A few injections of emetine were given while the vaccine was being made.

*Progress.*—During the month he remained in Calcutta he improved considerably, the stools being much reduced in numbers and improved in consistency. He then had to return to the hills against my advice, but continued the treatment, and a month later reported that he was feeling well, and had only two stools a day. He now left off the bismuth and the injections, and quickly relapsed. In November he reported that he was very weak, although the diarrhoea was better, and soon after he was brought down to the General Hospital in Calcutta, when I found him to be suffering from very severe pernicious anæmia with only 880,000 red corpuscles per m.m., and he died of this complication a week later.

*Remarks.*—By returning to the hills and leaving off the treatment so soon this patient did not give it a fair chance. The termination with pernicious anæmia is significant in view of the frequent association of that disease with oral sepsis.

**CASE 4.**—European male, aged about 35. Sent to me in November 1915 by Dr. McCombie of Assam, to whom I am indebted for his subsequent history.

*History of illness.*—Began in the rainy season of 1914, so was of over a year's duration when seen by me.

*Present condition.*—Typical sprue and slightly anæmic. Mouth showed a few ulcers from which cultures were made. Bowels loose with three or four whitish frothy stools daily.

*Previous treatment.*—On strict milk diet and occasional doses of santonine he had improved but relapsed after an attack of fever or on increasing his diet.

*Treatment.*—Autogenous oral streptococcal vaccine made, and six-weekly injections given by Dr. McCombie, with the result of decreasing the number of the stools and clearing up of the ulcers in the mouth. He subsequently suffered from irregular attacks of diarrhoea after slight indiscretions of diet, but on the whole steady improvement took place. He went to England in 1917, and at the end of that year was reported to be practically fit.

**CASE 5.**—European female, aged 21. Consulted me for sprue in February 1916.

*Duration.*—Since May 1915, nine months.

*Present condition.*—Stools several daily, large and light coloured. Tongue red and raw at the edges.

*Treatment.*—Autogenous oral streptococcus vaccine injected weekly.

*Progress.*—No effect from the first two doses, but after the third one the stools improved in consistency and colour, and after the fourth the soreness of the gums disappeared and the appetite improved. After the fifth she felt well and went for a change and was able to digest every thing and began to gain weight steadily.



*Subsequent history.*—I heard of her in July 1917, about two years after the course of injection was completed, and she remained in good health.

CASE 6.—European female, aged about 40. Consulted me in March 1916.

*History*—Several large light-coloured stools daily for some months. Mouth not very sore, but edge of tongue red.

*Treatment.*—Autogenous oral streptococcal vaccine injected weekly. Bismuth salicylate by the mouth.

*Progress.*—After a month she was better, and after another month she wrote that she considered herself cured and had stopped the injections, but would write for more vaccine if the trouble returned. I have not heard further of her, as a letter of inquiry at the end of 1917 did not bring an answer, so she had probably changed her residence.

CASE 7.—European female, aged 55. Consulted me in March 1916, for chronic diarrhoea not yielding to treatment.

*Present condition.*—Stools light coloured, and six to eight daily. Mouth and tongue sore.

*Treatment.*—Autogenous oral streptococcal vaccine made and seven weekly injections given by Dr. Ollenbach.

*Progress.*—The stools became solid and of a natural colour, and the ulcers and soreness of the mouth disappeared.

*Subsequent history.*—Over a year and a half later she was reported by her doctor to be quite well, and able to eat curries.

CASE 8.—European female, sent to consult me by Dr. Waters, of Asansol, to whom I am indebted for the after-history of the case.

*History.*—Illness began in the middle of 1915, ten months ago.

*Present condition.*—From one to six large, light coloured, frothy stools daily. Mouth and throat very sore.

*Treatment.*—Autogenous oral streptococcal vaccine made in April 1916, and weekly injections given, by Dr. Waters, who reported that she improved greatly by July, and after further injections she appeared to be cured. Later she became careless about her diet and relapsed during 1917, when she improved again greatly on milk diet, and yellow santonine.

CASE 9.—European female, aged 30. She came from Burmah in April 1916, to be under my treatment as a last resource.

*History.*—Illness began in the middle of 1914, with sickness, loose stools and sore mouth, with intervals of improvement. During 1915 and the early part of 1916, the symptoms increased in severity, with ulceration in the mouth and loosening of the teeth until she could only take milk. Her weight had become reduced to five-stone, and she was so weak that she had frequent short fits of unconsciousness.

*Present condition.*—Mouth very sore with numerous small ulcers. From five to ten typical loose, nearly white, frothy large stools daily. Very weak and bed-ridden.

*Treatment.*—Bismuth salicylate, in 15-grain doses, three times a day to control the diarrhoea. Autogenous oral streptococcal vaccine injected by me. Milk diet at first gradually increased as the mouth and stools improved. Later she took up to twelve small Indian bananas daily, and fried liver, and gained from two to three pounds a week.

*Progress.*—At first she felt ill on the day of the injections, a slight reaction, but better for the rest of the week up to the next one. She improved slowly but very steadily. After she had gained 20 lb. in weight she had no further attacks of diarrhoea, while the soreness of the mouth had also disappeared. At the end

of five months she had gained two stone in weight and felt quite well. I now allowed her to return to Burma and leave off all treatment. In reply to my inquiry, she reported, in January 1918, that she had had no relapse and remained quite well sixteen months after cessation of the treatment, although living in the country in which she first contracted the disease.

*Remarks.*—This was the most serious case of the present series, and a most convincing example of the benefit of the vaccine treatment in a desperate case, after prolonged treatment on the usual lines had completely failed.

CASE 10.—European female, aged about 45, who consulted me in November 1915.

*History.*—Had suffered from sprue-like diarrhoea for no less than 15 years, which got worse whenever in the Darjeeling hills.

*Present condition.*—About five large, loose, light-coloured stools daily. Tongue raw and red at the edges, while small sores appear in the month when the diarrhoea is worse.

*Treatment.*—Autogenous oral streptococcal vaccine made, and ten weekly injections given, by me. Bismuth salicylate was also given.

*Progress.*—After five injections she expressed herself as much better, but still had two stools daily, sometimes formed. After ten injections she gave up the treatment, and I subsequently learned that she had relapsed.

*Remarks.*—In this case the treatment failed, but two and a half months' trial in a case of fifteen years' duration can hardly be said to have given it a fair chance.

CASE 11.—European female, aged about 30, who consulted me in October 1916.

*History.*—Chronic diarrhoea for four years, which persisted, in spite of a diet of milk and slops, until she had become very emaciated.

*Present condition.*—Several frothy, light yellow coloured stools daily. Tongue sore.

*Treatment.*—Autogenous oral streptococcus vaccine injected weekly, and bismuth salicylate by the mouth.

*Progress.*—After a few injections the number and character of the stools had improved and she was nearly all right for two months, after which a relapse occurred. In the meanwhile she had gone to the United Provinces, and as I had no more of her vaccine left, a fresh one was made in her new station and twelve injections given in the course of two months, together with six injections of emetine and a milk diet. This further course resulted in the disappearance of her trouble. In January 1918, about one year later, she remained well and could eat almost anything.

CASE 12.—Anglo-Indian (new style) female, aged 48, whom I saw frequently in consultation with Dr. Ollenbach, to whom I am greatly indebted for notes of the case.

*History.*—She had suffered for about two years from white diarrhoea, without any appreciable improvement from previous treatment. She also had ascites, due to cirrhosis of the liver, probably alcoholic in nature.

*Present condition.*—Very emaciated and with extensive ascites and oedema of the feet and legs due to cirrhosis of the liver. Mouth and tongue very sore and with superficial very painful ulcers. Stools seven to eight daily from ash-grey to white in colour and very offensive.

*Treatment.*—Frequent tapping of the peritoneal cavity and draining of fluid from the legs with Southey's tubes for the ascites and oedema. An autogenous oral streptococcal vaccine was made and eight injections given between January 13th and March 8th, together with bismuth salicylate by the mouth, and a second course of nine injections of a freshly prepared similar vaccine from April 24th to June 26th.



*Progress.*—The immediate effect of the vaccine treatment was to reduce the stools to from two to four daily and improve their colour and to stop the soreness of the mouth. There was a slight return of the diarrhoea during the six weeks between the two courses of vaccine, but the second one was followed by complete cessation of the diarrhoea and disappearance of the ulcers and soreness of the mouth. One healthy, normal-coloured stool was passed daily with occasional constipation. The ascites, however, continued and between January 30th and July 19th, 1,762 oz. of fluid were removed from the abdomen in ten tapplings, but the cirrhosis of the liver proved fatal on the 9th of August.

*Remarks.*—The entire cessation of the bowel and mouth symptoms of sprue under the vaccine treatment in spite of the presence of a progressive cirrhosis of the liver in this case was most remarkable.

CASE 13.—European female, aged about 40. Sent to me by Lieutenant-Colonel R. P. Wilson, I.M.S., for sprue.

*History.*—Has suffered from sprue for more than twelve months with weakness and debility. Many drugs and a change out of Calcutta had failed to benefit her. The mouth had been sore at times.

*Present condition.*—Mouth sore and edge of the tongue red. Stool light coloured and large, several passed daily. Abdominal pain at times.

*Treatment.*—Oral autogenous streptococcal vaccine made by me and injected by Colonel Wilson. Great improvement took place in both the bowel and mouth symptoms, and she was able to do heavy work. Two and a half months after cessation of treatment a partial relapse took place and a fresh vaccine was made by me, which was injected in Lucknow. I have recently heard from her that great improvement has again resulted and the treatment is being continued. On most days only one formed yellow stool is now passed.

CASE 14.—European female, aged 28. Sent to me by Dr. Smythe, of Assam, in August 1917 for sprue of three months' duration in second stage.

*Present condition.*—Had lost much weight, being now only 5 st. 6 lb. Tongue sore and painful on eating. Stool, large, frothy and putty coloured, up to 8 daily. On milk diet the stools had become reduced to one white formed stool daily, but the mouth remained sore, and bowels now and again loose.

*Treatment.*—Bismuth salicylate given and an autogenous oral streptococcal vaccine injected weekly.

*Progress.*—After three injections had been given both the tongue and the bowels had improved, when she returned to Assam, where Dr. Smythe continued the injections up to December. By this time her health had improved considerably and she had gained a stone and a half in weight, but her tongue still became sore periodically. After a Christmas indiscretion in diet she had a relapse. Seen by me early in February 1918, when she still had sprue symptoms, although over a stone heavier than when I first saw her. A fresh vaccine has been made for her, and the treatment is being continued.

CASE 15.—European male, aged 40, who came from Eastern Bengal to consult me in August 1917.

*History.*—Attacked by acute diarrhoea in July 1914, which passed into a chronic form with 6 to 7 whitish offensive stools daily. Late in 1915 I made an oral streptococcal vaccine, which was injected by his local doctor without effect. He went to England in April 1916, where he was treated for chronic dysentery with emetine with some improvement, although the diarrhoea never entirely ceased. Returned to India in February 1917, and in June was treated for seven weeks in the Calcutta Medical College Hospital for sprue with little benefit, and so was advised to return to England. Before doing so he consulted me again, when I made

another oral streptococcal vaccine for him. When the dose was increased to 1½ c.c. a reaction occurred in the form of a temporary increase in the number of the stools for five or six days, since which he has been much better with formed stools daily of a yellow colour. By the end of December 1917 he had put on over two stone in weight, and the tongue, which used to be like a raw piece of beef, was almost normal. He was seen by me on 25th January 1918 when he was in good health and had reached his normal weight of 13 stone, although in August last he only weighed 9 st. 4 lb., a total gain of 3 st. 10 lb. He is now able to do his work without fatigue.

CASE 16.—European female, the wife of a medical man in Assam, who wrote, in September 1917, to say she was suffering from early sprue-like diarrhoea. Sent him some culture tubes to inoculate from her mouth and return and made an autogenous streptococcal vaccine, which he injected.

*Progress.*—She rapidly improved on the vaccine treatment, and came to see me in Calcutta in December 1917, when her stools were normal in colour, consistency and number, while she had regained the weight she had lost and looked and felt quite well.

CASE 17.—A European Military Assistant-Surgeon, aged about 25.

*History.*—Got hill diarrhoea in Burma in 1909, which developed into sprue, as is often the case. His tongue showed aphthous patches on and off. He was better in 1914 and quite well in 1915. In March 1916, he weighed 150 lb. and went on field service to Mesopotamia, but got a relapse of his sprue in July 1916, and was invalided back to India. The diarrhoea diminished at the end of 1916, but the stools were still bad. In May 1917 he was granted permission to come to Calcutta to be treated by me.

*Present condition.*—Very weak and weight only 104 lb. Stools large and light coloured with much flatulence. Mouth sore and pyorrhoea present.

*Treatment and progress.*—Autogenous oral streptococcal vaccine made and nine injections given, with the result that the pyorrhoea greatly improved, but the stools still remained of the same character, and at the end of August he only weighed 99 lb. The vaccine was continued and bananas ordered, and he began to gain weight for the first time, being 106 lb. in the middle of November, and the stools were formed, although still light coloured. Fried liver was now added to the diet, and pancreatine given after meals.

I saw him on 18th January 1918, when the stools were better coloured and only one formed motion daily. He could eat toast and fish, but bananas did not now agree with him. He had gained a total of 29 lb. since the vaccine treatment was started six months before, and had put on 18 lb. in the last six weeks, and felt much stronger. The treatment is being continued.

The above seventeen cases are a consecutive series including all those I have treated during last four years, of which I have got any detailed histories and records of the progress. In addition, five more patients with sprue and sprue-like diarrhoea have been treated in a similar way with autogenous oral streptococcal vaccine, the only records of which I have is that in each case there was satisfactory improvement; but I have not been able to follow them up, several having left India, so I cannot say what the ultimate results were, although when I last heard from them not long after the completion of the treatment there had been no recurrence

of the trouble. It will be observed that several of the later cases recorded above are still under treatment, but I have included them so as to present as complete a record as possible of my trials of the vaccine up to date of writing early in 1918.

*Cases of Diarrhœa associated with Pyorrhœa treated with Oral Autogenous Streptococcal Vaccines.*—Two lady patients with symptoms of indigestion and diarrhœa not of a typical sprue character and pyorrhœa, were sent to me by Dr. Williams, of Jharia, for whom I made autogenous oral streptococcal vaccines, which he injected. He subsequently reported that in both cases the treatment was very successful, the digestive trouble disappearing, both health and weight being regained; so they are worthy of mention here. I have previously reported on the value of autogenous oral streptococcal vaccine in pyorrhœa (*Indian Medical Gazette*, April 1915, p. 121) and have since used in combination with removal of tartar by skilled dentists with satisfactory results, if not in too advanced a stage, although prolonged treatment is sometimes necessary. In recent cases I have not used emetine as well, as I found the amœba bacilis only in a minority of cases, and regard the streptococcal infection as the more important one.

#### ANALYSIS OF THE RESULTS OF THE VACCINE TREATMENT.

In considering the results obtained in the foregoing series of cases, they may be compared with those obtained by an analysis I made several years ago of 45 consecutive cases treated in the Calcutta European Hospital already referred to. In view of the chronicity and relapsing nature of sprue, I must first define what I regard as a "cure" in classifying the cases, and I propose to adopt as the standard complete absence of symptoms for a year and upwards after the cessation of treatment. By "greatly improved," I mean the cessation of diarrhœa with disappearance of the mouth symptoms accompanied by great improvement in the general health, but in which the recovery is not known to have persisted for a year. In all but one case, which relapsed, this was due to sufficient time not having elapsed or the after-history not being obtainable, so that in most of these the ultimate obtainment of a cure is not excluded, while in several of them it is highly probable. By "improved," I mean very marked diminution of the symptoms, but without their complete disappearance, or with fairly early recurrence, commonly due to premature errors in diet. As it is obvious that in cases treated as recently as 1917, sufficient time has not elapsed to give them a chance of being classed as cures, they are shown separately from the earlier cases in which the injections were

finished before 1917. The totals of both classes are also given in Table I for comparison with the European Hospital figures. The two cases reported in my former paper are added for completeness.

Table I.—Results of Vaccine compared with former treatment.

|                                 | Cured. | Greatly im-<br>proved. | Improved. | Not im-<br>proved. | Died. | TOTAL. |
|---------------------------------|--------|------------------------|-----------|--------------------|-------|--------|
| Vaccine cases before 1917 ...   | 7      | 4                      | ...       | 1                  | 1     | 13     |
| Vaccine cases of 1917 ...       | ...    | 3                      | 3         | ...                | ...   | 6      |
| Total vaccine cases ...         | 7      | 7                      | 3         | 1                  | 1     | 19     |
| Former European Hospital cases. | ...    | 5                      | 8         | 26                 | 6     | 45     |

*Note on table.*—Two of the European Hospital series were discharged from hospital as cured, but one relapsed in seven months and was eventually discharged no better, and the other still had some symptoms of sprue on leaving hospital, so neither come under my definition of "cured." The three vaccine cases entered as "improved" are still under treatment. One case (No. 12), shown as greatly improved, died of cirrhosis of the liver some time after all the sprue symptoms had disappeared.

The contrast between the two series of cases is very striking. Thus, while none of the 45 hospital cases could be classed as "cured," no less than 7 out of the 13 cases treated long enough back to allow of an estimate of the ultimate result being recorded came under my definition of cure, while 4 more were greatly improved. Of the two failures among 19 vaccine cases, one was a case of 15 years' duration, who stopped the treatment after only ten injections, and the other returned to an unfavourable hill climate in the unhealthy rainy season after only one month's treatment, against my advice, and later died of complicating pernicious anæmia, neither having given the treatment a fair chance. Against these two failures, just over one-tenth of the series in the vaccine cases, we have in the 45 hospital series no less than 26 patients "not improved" and 6 deaths from the disease, that is, over two-thirds of the total.

Even if liberal allowance is made for the hospital series having possibly been more severe on the average than the vaccine cases, (which is open to doubt, because, as a matter of fact, the histories show the latter to include a larger proportion of very chronic cases,) the results of the vaccine treatment shows a vast improvement on former lines of treatment as illustrated by the large hospital series. Case 9 of the vaccine group was as serious a case as can well be imagined, yet recovered completely in a much

shorter time than many of the hospital cases remained under treatment without any improvement. The increase of weight by from one to three stone in a number of the vaccine cases is also strong evidence of its value.

#### IS SPRUE A STREPTOCOCCAL INFECTION OF THE ALIMENTARY CANAL?

In my former paper reporting the success of the vaccine treatment in two very chronic cases of sprue, I pointed out that, if further similar results were obtained, they would go far towards supporting my suggestion that the disease is essentially a streptococcal infection, originating in the mouth and spreading down the intestinal canal. The present extended series of cases lend strong confirmation to that view of the disease. Both the frequent rapid improvement of the mouth symptoms and the occasional reactions in the form of a temporary increase of the diarrhoea, quickly followed by striking decrease of the bowel trouble, indicate that the oral streptococcal vaccine has a specific effect on the disease, which is difficult to account for except on the supposition that this class of organism is the cause of the trouble. The two cases in which both pyorrhoea and looseness of the bowels disappeared under the same treatment, are also of significance in this connection. The complication of Case 3 with pernicious anæmia, which has been shown by Hunter and others to be associated with oral sepsis, is also of interest, and

it is also of interest to recall that Sir Almroth Wright has shown that human blood and tissues have comparatively very little resisting powers against the invasion of streptococci as a class. It would not therefore be surprising if the digestive derangements, which not infrequently develop into sprue in tropical climates, should sometimes be followed by infection of the intestinal canal with the pathogenic oral streptococci so often found in almost pure culture in pyorrhoea and other inflammatory and ulcerative conditions in the mouth, and which form such an important part of the clinical picture of sprue itself. If this paper leads others to give a careful and prolonged trial to oral autogenous streptococcal vaccines in the treatment of sprue, it will have served its purpose.

#### THE PRESENT POSITION OF THE TREATMENT OF SYPHILIS.

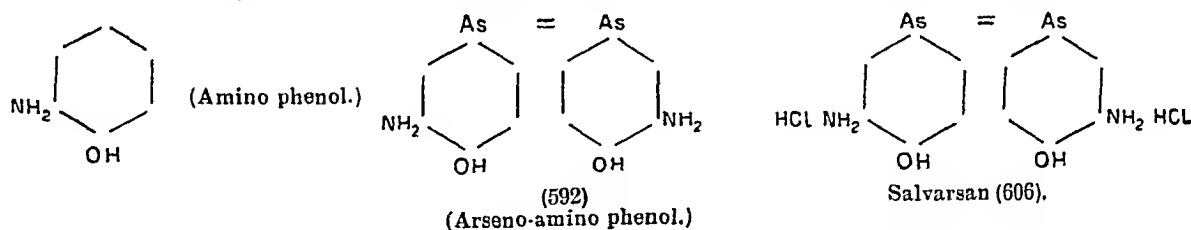
BY H. S. MATSON,

MAJOR, I.M.S.,

Poona.

SALVARSAN is the di-hydrochloride of the base amido-arseno phenol. Amino phenols, from one of which it is derived, are obtained by the reduction of nitro phenols, and are soluble readily oxidisable bases capable of forming salts with acids.

The relation of amino phenols to the Salvarsan bases is shown by the formulas below:—



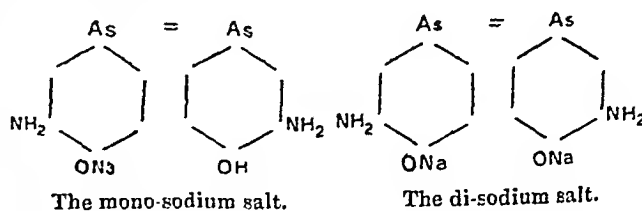
I had previously met with a similar instance of this termination of sprue.

I am aware that Bahr in Ceylon and Ashford in Porto Rico have demonstrated a close association of yeast fungi with sprue; but this class of organism is so widely distributed that few can escape swallowing it, while the great derangement of the digestive canal in sprue, whatever its cause may be, may well afford suitable conditions for rapid multiplication of the yeast fungus in the intestinal canal without its necessarily being in any way the exciting cause of the disease. It must also be allowed that the constant presence of streptococci in the mouth makes it difficult to prove the causative relationship of this class of organism to sprue, but my theory has the practical advantage of having indicating a promising line of treatment, the considerable success of which, as recorded in this paper, in its turn lends support to my view, and makes it at least worthy of serious attention. In this connection

Salvarsan, the trade name for the hydrochloride of arseno-amino phenol, is suitable, readily oxidising in the presence of air, forming highly toxic compounds of a grey or brownish colour, and slowly soluble in both water and saline.

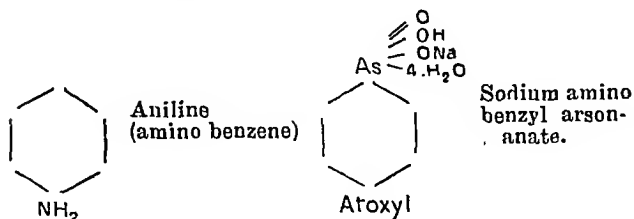
By replacement of a hydrogen group in the phenol radicles by sodium, a salt is formed which is less toxic and rather more soluble in water, but the destruction of the hydroxyl groups affect the therapeutic value of the compound.

In alkaline solution Salvarsan ordinarily exists in this form:—



The effect of arsenic, in what for lack of a better term were described as cachexias, usually

the outcome of parasitic blood infections, has long been known, and the result of investigations into the nature of Sleeping Sickness, a disease which bears to Trypanosomiasis the same relation as general paralysis to syphilis, was the production of Atoxyl, which in form is a fairly simple substitution of Aniline, with the Arsenic in the pentavalent form:—

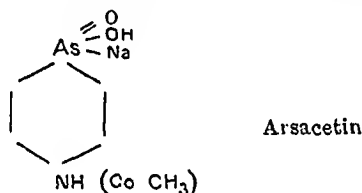


In the light of recent events, it is interesting to compare the constitution of Atoxyl with the last word in antisyphilitic treatment.

Neo-Salvarsan, the trade name for the methyl sulphonate of amido-arseno phenol.

(a) In atoxyl the arsenic is saturated and pentavalent, and therefore undesirably toxic; in Salvarsan it is unsaturated (trivalent).

(b) In reference to the amino group, the arsenic is in the para relation in atoxyl, whereas

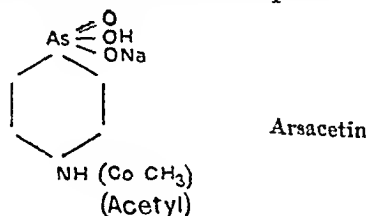


in Salvarsan it is in the meta position; the position of the various radicles in the phenol ring seems to exert an important influence on both the toxicity and the therapeutic value of these compounds.

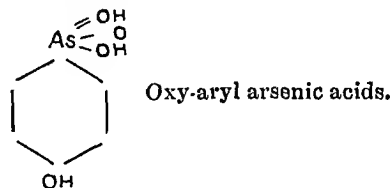
(c) Finally, the hydroxyl is not directly attached in atoxyl to the benzene ring; in other words atoxyl is not a phenol. Salvarsan salts give the group reaction for phenol with ferric chloride.

Atoxyl, as its chemical form would suggest, is unstable and highly toxic, and with a view to diminishing the latter objection an acetyl radicle was introduced; arsacetin is more stable, but still very toxic, and from a therapeutic point of view shows very little advance on atoxyl.

The single amine group is destroyed by the replacement of its hydrogen groups by acetyl, and it will be found that any interference with the amine groups increases toxicity and diminishes the therapeutic value of the compound.



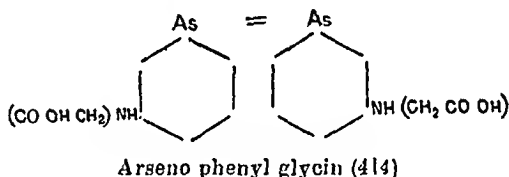
The further advance is due to Ehrlich who, starting from the basis of atoxyl, prepared di-amido-arseno phenol by the reduction of "the amines of oxy-aryl arsenic acids."



There are several considerations which finally emerge from a consideration of the form of such arsenic compounds as have been found to have a value in the treatment of syphilis.

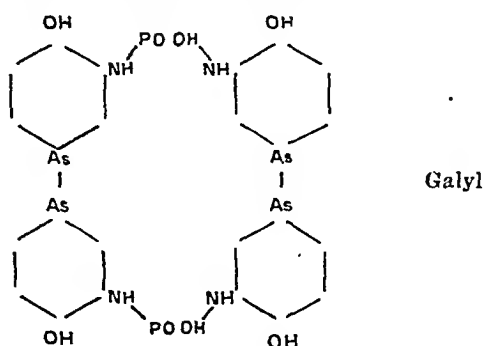
(a) The arsenic should be unsaturated (trivalent), and as far as possible not loaded with substitution radicles which, though they may increase the solubility or stability, tend to diminish the therapeutic value.

(b) The arsenic should be in the para position, and the amino group in the ortho position in a phenol ring; compare the very efficient arseno phenyl glycin with the now discarded arsacetin, and the importance of the condition of the arsenic radicle will be apparent.



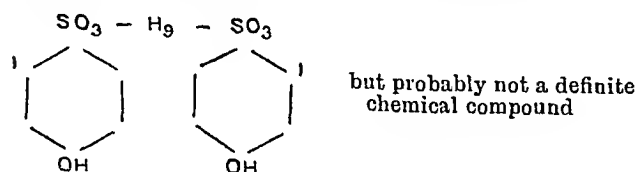
Neo-Salvarsan is prepared by substituting one amine hydrogen by methyl sulphonate sodium, and though sulphonates are generally soluble, the effect of destroying the amine is to diminish somewhat the spirillicidal value of the drug as compared with Salvarsan.

For the same reason "Galy" (4 arseno phenols strung together by phosphoric groups) is more toxic and somewhat less effective; though the arsenic content goes up to 35.5 per cent. as against 31 per cent. in Salvarsan.



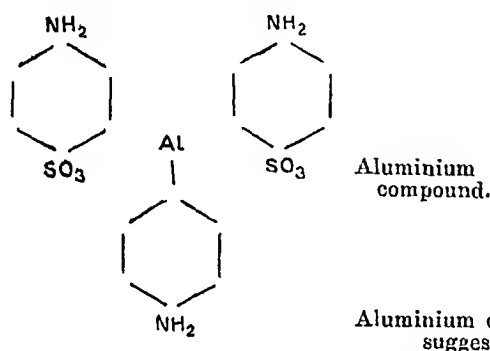
Antimony is allied to arsenic, and the obvious move was in the direction of an antimony amido phenol. Hugel states that this substance is highly toxic (possibly associated with the high atomic weight of antimony), and therapeutically useless.

Anogon is a preparation of German oxygen, and is described as "di iodo para phenol sulphonic mercury"; it is possibly of the formula—



It is entirely insoluble in ordinary organic solvents; any attempt to prepare a soluble salt brings down the mercury and in addition to being less stable, it is said to be of less therapeutic value than a similar suspension of mercury in olive oil.

McDonagh has prepared a group of substances

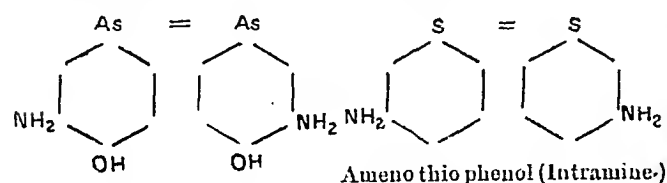


on entirely different lines, which involve a very clear conception of the means by which such drugs act on the parasite of syphilis.

Salvarsan, he says, acts catalytically as an "oxidase" and yet as a reducing agent, and with this explanation in his mind he sought a substance that, having greater reducing powers, would do all that Salvarsan has failed to do.

In preparing "intramine" he used sulphur, which in addition to having a low atomic weight has more than one valency, and is a reducing agent.

The formula shows that sulphur replaces the oxygen of the phenol radicle forming a thio phenol, and if the new substance turns out to be as therapeutically effective as arseno-amido phenol, these conclusions with regard to the conditions that govern the formation of efficient anti-syphilitic drugs (Ehrlich's arsenic compounds) will have to be revised. As will be seen from the formulas given below, intramine bears little resemblance to the Salvarsan group.

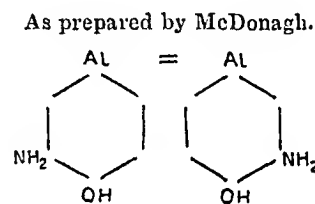


Intramine is said to be particularly valuable in the treatment of tertiary lesions "when its reducing power becomes effective." In the army such cases are becoming rare, but intramine certainly appears to be entirely non-irritant and

non-toxic, but to exert very little influence on the primary or secondary lesions of syphilis.

[Harrison and Mills find intramine and farri-vine valueless in syphilis.]

He has prepared a group of metallic substances which seem to be amino sulphonates loosely strung about a metallic radicle. They are mostly insoluble, but unstable (the metal coming down in the presence of weakly alkaline solutions) and some, as for example the iron and manganese compounds, are liable to produce alarming symptoms on injection. Formulæ are given below, an interesting compound would be (if aluminium turns out to be as effective as has been stated) an aluminium amino phenol, the aluminium replacing the arsenic in a Salvarsan group.



In the earlier part of the paper atoxyl has been called in from a substitution product of aniline. Ehrlich showed that it actually is a salt of amido phenyl arsenious acid. Arseno phenol itself possess marked spirillicidal value, but is difficult to get pure, is very unstable, and probably very toxic, but is interesting as demonstrating the value of adding amines in the ortho position to the hydroxyls of the phenol ring.

Summing up, then, shortly, we have in Salvarsan a chemical substance that appears to be a condensation of two arsenic amino phenols, with the arsenic unsaturated, and the amines ortho to the hydroxyls of the phenol rings, and so far substances of this general form seem to be highly effective against syphilis in all its stages.

Whether this particular grouping is as selective to syphilis as for example the quinine formation is to malaria remains to be seen; there is no doubt that in its existing form the Salvarsan group leaves much to be desired. Apart from its locally irritant and generally toxic effect, there remain a certain percentage of cases that do not react to Salvarsan, and something is desired which is more stable, more soluble, less irritant, and non-toxic.

The action of Salvarsan in the human body is obscure, *in vitro* it does not inhibit the movements of spirochaetes, but the mixture of drug and spirochaete injected into an otherwise susceptible animal does not infect it with syphilis; if an extract of human liver be added to the mixture, *in vitro* the spirochaetes are



destroyed, the liver extract presumably functioning as complement.

The serum of patients injected becomes anti-toxic, and children suffering from congenital syphilis rapidly recover if the mother be given a course of Salvarsan though no trace of arsenic can be discovered in the milk.

Stated simply the truth appears to be that arsenic can be introduced in the form of Salvarsan (3 grains of arsenic) in sufficiently large doses to exert its selective action on the spirochæte without damaging the host. The destruction of spirochætes which follows results in the liberation of endotoxines in sufficient quantity to set up a protective reaction in the form of antitoxines (comparable to the effects of vaccine inoculation).

No permanent immunity results, so that at present the clearest evidence of the cure of syphilis is the possibility of reinfection.

The Herxheimer reaction has been regarded as the intensification of existing lesions as the result of stimulation by insufficient dosage, it is very much more likely to be the reaction of existing lesions to the sudden flooding of the body with free endotoxines which results from a dose of Salvarsan.

Little is really known as to the precise method of action of the drug, it certainly is not an antitoxin, and the therapeutic effect is a combined one in which the drug and tissues co-operate; it is probably the failure of the latter factor (in producing sufficient antitoxin) that is responsible for the few refractory cases.

The ill-effects of Salvarsan when they have occurred have been shown to be almost entirely due to arsenic poisoning; an average dose of Salvarsan (6 of a gramme) contains nearly a third of its weight of arsenic (2 grains) and most of the earlier fatalities were due to faulty administration.

The effect on a weakly child suffering from malignant congenital syphilis of the destruction of enormous numbers of spirochætes (by Salvarsan) and the consequent liberation of endotoxines into the circulation can well be imagined. Arsenic being excreted unchanged *viâ* the intestinal mucous membrane and the kidney's due attention is naturally paid to these channels, and intestinal or renal disease (when not due to syphilis) naturally contraindicates the administration of Salvarsan.

There are a few cases of personal idiosyncrasy to every powerful drug, but the mortality from all causes in the past has been under 2 per cent. and at the present moment is practically *nil*.

Salvarsan exerts a most beneficial effect on the general health, and the spirochæte never becomes tolerant to small repeated doses of the drug.

The merit of Salvarsan is that by its means arsenic can be given in such form and in such dosage as to exert a powerful selective action on the spirochæte without affecting the host.

There are two methods of introduction of the drug into the organism.

(A) The intravenous method.

(B) The intramuscular method.

There is little doubt, on general grounds, where one can rely on one's technique that the injection of a solution into a vein forms a ready and convenient method of administration. There are no difficulties in the way of local irritation, and no doubt about the amount of drug that actually gets into the circulation, but having said so much one has said all that can really be said in favour of the method.

There is an impression growing up that in the perfected form in which Salvarsan is obtained to-day, the arsenic is excreted too rapidly to produce its full effects.

Major Harrison in his paper of May 15, 1917, finds that the intramuscular injection of Neo-Salvarsan is more effective than the intravenous form in both primary and secondary stages, that the general tonic effect is far greater and that no Vaso motor effects follow and that the spirochætes disappear as rapidly from the primary lesion.

The intravenous method is not one that leaves any margin of error from the results of carelessness or ignorance. The escape of even a small quantity of fluid around the site of injection sets up severe local inflammation. Venous thrombosis and air embolism are both apt to cause alarming symptoms, and lastly after (and during) the course of eight injections, which constitute the modern treatment, vaso-motor symptoms (anaphylaxis) usually transient, but sometimes serious, are not uncommon.

These objections do not hold in the intramuscular method, the one serious drawback to which is summed up in the words local irritation. The method is one that can be safely put into the hands of the general practitioner, and overcomes the objection to too rapid excretion. Arsenic injected intravenously is found to have been completely excreted by the fourth day, intramuscularly it is still found in the urine on the sixteenth day.

Major Harrison finds that a solution of Neo-Salvarsan in 1 c.cm. of 4/ Stovaine emulsified in Creocamphor cream eliminates discomfort sufficiently to make the intramuscular injection practicable for routine use.

Major Frost, R.A.M.C., Director of the Laboratory for Venereal Research at Poona, has devised a method which has found application in a sufficiently large number of cases to enable one to generalise on the conclusions at which he has arrived. A substance which combines the anæsthetic and antiseptic powers of phenol (to a lesser degree) but without its toxic effect is guaiacol, the methyl ether of a dihydroxy phenol, this was originally introduced for the

intramuscular treatment of syphilis by Balzer and Beauxais Lagrave in association with 50 Glucose which not only attracts an abundant flow of lymph to the site of injection, thus increasing rate of absorption and minimising irritation but protects the drug from oxidation.

Glucose is of course an aldohexose (an aldehyde derived from Hexane) and has no chemical effect on either arseno amido phenol salts or on Guaiacol.

The emulsion he uses is prepared by dissolving two parts of a chemically pure Glucose in one part of distilled water; to 17 c.c. of this 2 c.c. of Guaiacol and 1 c.c. of phenol are added.

Dissolve 6 grammes of Novo Salvarsan in a few minims of distilled water, and add solution to the bulk of 1 c.c. The results of the last two months at the Poona Institute are given below.

The expression "Slight symptoms" has been interpreted very generously, the slightest discomfort being sufficient to bring the case under that heading.

|                 | Ns 6 grammes in<br>15 c.c. water | Ns 6 grammes in<br>Guaiacol solution |
|-----------------|----------------------------------|--------------------------------------|
| No symptoms ... | 28                               | 100                                  |
| Slight symptoms | 24                               | 20                                   |
| Pain ...        | 4                                | 10                                   |

Later results have shown a considerable improvement on these figures.

Practically all cases have shown a negative Wassermann at the end of a course, and the ideal aimed at, that cases of syphilis should be fit to return to Active Service within six weeks, has been to a remarkable degree realised.

One may assume that 90 per cent. of cases will not now suffer any appreciable discomfort from a course of intramuscular injection of Neo-Salvarsan.

#### CONCLUSIONS.

(1) In conclusion the present position of the treatment of syphilis is that in the intramuscular injection of Salvarsan one finds the most satisfactory solution of the problem.

Trivalent arsenic can in this way be introduced into the organism in such doses as to be able to exert its selective effect without damaging the host.

(2) So far no other chemical compound used in the treatment of syphilis has been comparable to arseno amido phenol and its salts in therapeutic efficiency.

(3) The relation of the radicles of arseno amino phenol in the phenol ring forms a combination which is destructive to and selective for the spirochæte of syphilis in the same way and probably to a greater extent than the quinine grouping to malaria infections.

(4) The amine groups are of paramount importance to conferring protection against the toxic effects of arsenic.

(5) Interference with them (*i.e.*, the formation of substitution products with their hydrogen atoms) may increase the solubility or stability of the compound, but tends to diminish the therapeutic value.

(6) The diminution seems to bear a direct relation to the extent of such interference.

(7) The introduction of such metals as aluminium in the place of arsenic has so far found only a limited application, the metal to ensure the effectiveness of the new compound must be in close association with a amino phenol ring, *i.e.*, directly combined with a carbon atom of the ring, not merely as the salt of an amino aryl acid.

#### THE PREVENTION OF MALARIA IN CANTONMENTS.

By P. HEHIR, M.D., D.P.H.,

COLONEL, I.M.S.

It is proposed to deal with only a few aspects of the wide subject of the prevention of malaria in cantonments, limiting the remarks to the measurement of malaria, reduction of breeding places of anophelines, relapses and their prevention, and quinine prophylaxis.

Malaria is, throughout our Indian Empire, the dominating cause of inefficiency in troops in both peace and war. In peace it always heads the list of diseases in both European and Indian troops. In many of the cases which occur in troops and followers on field service, the initial infection is acquired in cantonments; the majority are relapses. The malaria of cantonments is to a large extent bred in the human occupants and anopheline population of cantonments.

In all cantonments we should make an enquiry into the amount of malaria present in the troops and other inhabitants, the breeding places of anophelines (especially the local malaria-bearing species), and the barracks, bazaars, and buildings which adult anopheline-carriers frequent. We should use a large-scale map and mark on it the extent to which malaria prevails in different barracks, bazaars, etc., and the breeding places of anophelines with the species—including all collections of surface water, streams, irrigation channels and water-courses generally, areas under wet cultivation, ponds, tanks, pools, borrow-pits, artificial collections of water small and large, stand-pipes, etc. The terrestrial waters and possible breeding places are best seen after a heavy shower. The cantonment should be divided up into areas, the area of each unit being in charge of the medical officer of the unit, the non-regimental areas being similarly subdivided and supervised. In large cantonments, when an officer with expert knowledge of malaria is available, he should, under the senior medical officer, be in charge of and direct all the anti-malarial measures that are being carried out. Each of these officers should have a map of his area, and keep it up-to-date as regards prevalence of malaria, breeding places still in existence, breeding places removed, fresh ones that have arisen, etc. The anti-malarial campaign in each cantonment should be planned after these preliminary enquiries have been carried out, and then systematically pushed from year to year.

The most accurate indication as to the prevalence of malaria in a cantonment is the *malarial index*. The most practicable indication is the *spleen index*, that is the percentage of children between 2 and 10 years of

age with splenomegaly due to acute or chronic malarial infection. The spleen-rate in troops, except in highly malarial stations, is in no sense a reliable estimate as to prevalence or intensity of malarial endemicity—troops are usually brought under treatment and the effects of the malaria checked before the spleen attains to any great degree of enlargement.

There is a considerable amount of malaria amongst Indian children in cantonments. Of 3,884 children in various cantonments examined a few years ago on the plains, it was found that during the malarial season there was an average of 60 per cent. with enlarged spleens, and 40 per cent. with malarial parasites in the blood. The children of cantonments are the chief reservoirs of malarial parasites, and the source whence a great deal of the malarial infection of troops spreads from year to year.

In every cantonment the breeding habits and bionomics of local anophelines generally should be studied, and a determination made as to the species of anophelines that are the local natural carriers.

Fresh breeding places for anophelines are still being created in many cantonments. Borrow-pits are still being formed—in road making, by the removal of earth for new buildings, in brick fields, rifle ranges, firing platforms, excavations for making defensive positions (trenches, etc.), during field days, or by double companies during military training, and in a score of other ways.

The chief anti-mosquito measures in cantonments embrace—rough canalisation of streams, irrigation canals and water-courses generally; levelling, grading, and embanking of rain-water channels, ditches and roadside drains; filling up of tanks, borrow-pits, excavations and depressions; covering of disused wells; covering with mosquito-proof material or periodical emptying of water cisterns; filling up excavations for bullock runs; treating all small collections of water that cannot be abolished with some larvicide once a week; preventing (where possible) excavations for building purposes within cantonments; removal of brick factories from cantonment limits, and disuse of grass farms within half a mile of barracks when these are near the breeding grounds of anophelines, or are themselves such breeding grounds. The mosquito gangs of cantonments who are chiefly used for kerosining collections of surface water should be employed in doing much of the work, which should be carried out systematically, the labour fairly divided amongst the men, and regularly supervised by the malaria officer, senior medical officer and medical officers of units.

The senior medical officer and malaria officer should be acquainted with all possible breeding grounds of anophelines in the extra-regimental areas of the station, and allot tasks to the mosquito gangs employed in these areas; medical officers of units doing the same in regimental areas.

The sanitary detachment, non-commissioned officers and men of all our British and Indian units should, in their annual course of instruction in military sanitation, be made familiar with the rôle of anophelines in malaria and the method employed in reducing their number. These men might be utilised in the anti-mosquito measures of all cantonments to a large extent. They should make collections of adult anophelines taken in the barracks and of anopheline larvæ from the surface waters. With their aid in most cantonments it should be possible to work out during a single mosquito season the anophelines in existence and the actual malaria-carriers amongst these. They are, as a rule, intelligent and keen men. Apart from supervision, all they require to guide them is a sound and well-considered anti-mosquito scheme for the areas in which they are employed.

A great deal of the unskilled labour connected with the reduction of mosquito-breeding places can be carried out by the troops themselves in their regimental areas. This has been done in many stations with advantage, and we have had several excellent examples of it in India and Burma during the last few years. We should

remember that it is our duty to employ all the smaller and least expensive methods before recommending large schemes.

It is possible to reduce the anophelines and the malaria in the cantonments of practically all malarial stations if the matter is taken in hand in a thoroughly methodical way, and a continuous anti-malarial policy be adopted from year to year. Patch-work and change of policy are responsible for many failures.

With the progressive decrease of breeding places of anophelines in and around cantonments there will be a corresponding reduction in the amount of quinine that will be necessary for curative and prophylactic purposes in garrisons, and the amount of labour required to keep down the number of breeding places will become yearly less.

There are many cantonments where this has actually taken place—stations in which malaria was prevalent and malignant, but in which the endemicity is now mild.

As instances of cantonments that have been vastly improved by persistent anti-malarial sanitation, mention may be made of Agra, Mhow, Belgaum, Hyderabad (Sind), Quetta, Bangalore, Cawnpore, River Forts Rangoon, Mandalay, Lucknow, etc.

In 1909 Agra yielded in our European troops 695 cases, in 1913 only 36, the strength remaining the same. The excellent anti-malarial work that was in progress in Mhow for a few years preceding 1913 removed the necessity of issuing quinine prophylactically; the same may be said of Quetta and several other stations. There is ten times less malaria in Belgaum than 20 years ago. The River Forts, Rangoon, used to be notoriously malarial, every man going to them getting infected; this is not now the case. Mandalay used to be one of the most malarious places in Upper Burma; it has ceased to be so. In Hyderabad (Sind) in 1908 the malaria ratio was 6 per 1,000 of strength; in 1913 there were only 29 cases throughout the year.

These instances demonstrate the highly satisfactory results obtainable by the active co-operation of all the authorities concerned, combined with an intelligent scheme of anti-malarial sanitation and serious attention to the treatment of cases of malarial infection both in hospital and subsequently. The work of reducing the breeding places of anophelines is tedious, exacting, and requires unremitting attention and supervision; in the absence of radical and prohibitively expensive operations it has to be carried out from year to year—the work must be uninterrupted; any relaxation will result in much of the advantages gained being lost.

Destruction of adult mosquitoes in barrack rooms is a by-no-means negligible defensive agency; the collective efforts of soldiers in barracks in this respect is capable of greatly reducing the number of anophelines present. Our troops should be encouraged to do this, and small hand-nets and traps might be placed in each barrack-room during the anopheline season.

We had the statement in several reports of 1913 that the punkah coolies employed in barracks were infected with malaria; in one garrison (Fort Govindgarh, Amritsar) 84 per cent. of them were infected. Of 430 punkah-coolies examined, 37 per cent. were found infected. These men should invariably be medically inspected before being entertained, and periodically examined afterwards, and they should get the same issue of prophylactic quinine as the troops; these remarks apply equally to all followers who sleep in proximity to barracks.

The keeping of European troops at non-malarial hill stations until the malarial season is over is a measure of considerable advantage to efficiency. The transfer of men severely infected with malaria to our convalescent depôts on non-malarial hill stations serves the purposes of eradicating malaria from the individual, and removing infected men from malarious stations in which, through anophelines, they disseminate infection. A series of observations on the children of Indian followers of British troops moved to hill stations where there was no

initial malaria, showed that a year's residence at such stations eliminates without any treatment 98 per cent. of malarial infections; 97 per cent of cases of malarial enlargement of the spleen in children disappear spontaneously in the same period. These conclusions were arrived at from observations made on 997 Indian followers' children in 7 different hill stations.

The detection, isolation, and specific treatment of all infected soldiers are of great importance in the prevention of malaria. Malarial patients should, during the anophelone season, be isolated in special wards and supplied with mosquito curtains. All known cases of active malarial infection should be admitted into hospital. This is very necessary, for, if not carried out, the men with malaria infect their comrades and may get re-infected themselves. One of the great advantages of remaining in hospital is that all our hospitals are provided with mosquito nets for malarial cases, whilst nets are not universally employed in barracks. All discharged cases of malaria taking quinine curatively should get their quinine *at the hospital* or inspection room daily; this enables the medical officer to see them regularly. During malarial infection the object should be, not only to check the paroxysms, but also to eradicate parasites from the blood by the use of quinine. Relapses in soldiers and in all other bodies of men under discipline can, to a large extent, be controlled. There should be but little residual malaria in troops. Relapses occur when previous infection has not been eradicated by proper quinine treatment. All troops and followers in cantonments known to be infected with malaria should be subjected to a course of quinine treatment lasting not less than four months. Were this universally adopted, there would be fewer cases of relapses in the late winter, spring, and early summer months. The method of treating malarial fever cases with quinine for a week or so, and then letting them fall into line with the men who are taking the drug prophylactically, is one of the many causes of the continuance of malarial infection amongst our troops. Under such treatment the curative administration of quinine is discontinued just at the time when the patient is most infectious to others through the gametocytes in his blood. The proper way to treat malarial fever in our troops' hospitals in India is to keep the patient in hospital and under quinine and mosquito nets until gametocytes are no longer to be found in the surface blood, then discharge him to attend daily for his course. Generation after generation of gametocytes and schizogonic parasites continue in the spleen and bone-marrow long after they cease to be found in the peripheral circulation—it is this recurring multiplication we should aim at eradicating; until this is done the infected person is liable to relapses, that is, to recurring paroxysms without re-infection, and also through malaria-carrying anophelines to infect others.

In a malarial cantonment during the malarial season, when fresh infections are constantly liable to occur, it is practically impossible to decide whether a particular case is one of re-infection or relapse. A careful scrutiny of each case with examination of the blood and a history of the course of the infection (if any) would probably give us information upon which we could draw inferences as to whether it was a re-infection or a relapse, but such deductions would not be scientifically reliable. The only indication of a re-infection would be a record to the effect that the preceding attack was caused by a species of parasite different from the one discovered in the blood during the attack under investigation, although this does not necessarily mean a re-infection; as the former infection may have been a mixed one, and one species have died out.

Relapse is one of the most common factors in malarial infection, and the asexual cycle is that phase in the life-history of malarial parasites most frequently associated with the primary infection and with the relapse, and with one relapse and the succeeding one. Relapse frequently follows the so-called spontaneous cure of malaria, because the asexual cycle in such a case often

persists in numbers that can be detected by the thick film or centrifuge method in the intervals of apyrexia. Infections treated with small doses of quinine will in all probability relapse, because the parasites of the asexual cycle in the spleen and bone-marrow are very slightly, if at all, affected thereby. Relapse is less likely to occur when the infection is promptly and vigorously treated, possibly because the older the asexual cycle the more resistant to quinine it becomes. When a relapse occurs with the presence of parasites in the peripheral blood during the administration of quinine by the mouth in sufficient doses, faulty absorption of the drug should be suspected.

These statements are based on the assumption that the perpetuation of the asexual cycle of malarial parasites in the blood, spleen and bone-marrow is the sole responsible cause of relapses. It is possible that, like *Trypanosoma gambiense* and other trypanosomes in relation to atoxyl and other treatment in the experimental production of trypanosomiasis in lower animals, the asexual forms of malarial parasites under certain conditions take on a relative immunity against quinine. We have so far no proved scientific grounds for believing that relapses are caused in any other way than by latent asexual forms of malarial parasites taking on activity and multiplying in the same manner they did during the stage of initial infection. Whether the stores of malaria become immune to the action of quinine under the conditions stated remains to be proved, but the assumption that they do give us a definite and practical line of quinine treatment in the early initial paroxysms. Anyhow, it would appear that in the intermediate phase of its life history, between the schizogonic and sexual, malarial parasites are certainly much less affected by quinine than are schizonts in early infections. The recent paper by Colonel S. P. James, I.M.S., lends support to this.

The special significance of the hypothesis rests in its application to the treatment of malaria. Small doses of quinine even in the slight infections may simply render the asexual cycle relatively immune, so that larger doses, which would have eradicated parasites in the early stage, are later without effect. It is probable that were larger doses of quinine given for the first 3 weeks than those usually administered during the initial infection, and progressively decreasing doses continued subsequently for the remainder of the 4 months' course, there would be considerably fewer relapses and re-infections. These remarks also emphasize the necessity of all cases of malarial fever reporting sick at once so as to get infected persons fully under quinine as soon as possible, and thus prevent the formation of gametocytes. Relapse cases, in cantonments, after the real malarial season is over, are very largely responsible for the preparation of malaria through anophelines when the latter start breeding again.

From our annual reports, we can measure the effect of quinine in cases treated in non-malarial hill stations. Men are sent up convalescent from malaria for 4 to 6 months, get one relapse, are put under a comparatively mild course of curative quinine treatment for 4 months, and no further relapses occur; in 98 per cent. of these cases their malaria is eradicated. In a large proportion of cases the same course of quinine treatment would not be successful in the plains, possibly because of re-infections, or because the asexual parasites are more immune to the action of quinine in the plains during the malarial season, or for some other yet undiscovered reason.

Records distinctly show that in those malarious stations in which curative quinine treatment is most persistently carried out, relapses are decidedly fewer than in those in which quinine treatment is adopted in a half-hearted way.

We are in possession of abundance of evidence pointing to the necessity of more continuous examination of the blood for parasites in fevers of unknown origin in malarious stations. To quote one group of facts in



support of this statement. In the Burma Division, up to August 1911, a large percentage of fever cases were returned as pyrexia of uncertain origin, the practice being to rely upon a single examination of a stained blood smear for malarial parasites. From that month onwards daily microscopical examinations of the blood in all cases of undiagnosed pyrexia was carried out, quinine being withheld until malarial parasites were found in the peripheral blood. Over nine thousand slides were examined in connection with 750 infections. In one case parasites were not found until the 8th day; in 2 on the 7th day, in 5 on the 6th day, in 4 on the 5th day, in 11 on the 4th day, in 43 on the 3rd day, in 127 on the 2nd day, the remainder on the 1st day; in other words, in a high percentage of proved malarial infections parasites were stated to be absent during the first paroxysm. In two Indian battalions quartered in Mandalay, which used to be a very malarious cantonment, six months after the adoption of this change, the place of practically all the cases of fever of uncertain origin was taken by malaria in the returns. A similar series of facts were recorded in the 6th (Poona) Division in the last quarter of 1913.

The records of our military hospitals show that frequently malarial parasites are not found in the peripheral blood during malarial paroxysms. The chief reason given for the failure to discover parasites is that the patients are at the time taking quinine prophylactically. When malarial parasites are in sufficient number in the blood to give rise to malarial paroxysms, they can in the large majority of cases be found in the peripheral blood, especially if the thick film method is employed and quinine is temporarily withheld. The method of centrifuging malarial blood by concentrating infected red cells just beneath the leucocyte layer would forcibly demonstrate this fact.

The practice of giving quinine to cases where malarial parasites are definitely known not to exist is unsound therapeutically. One great disadvantage of giving quinine in cases of doubtful fever is that after its use the diagnosis of the case may never be cleared up. When all evidence shows that there are no malarial parasites in the peripheral blood, abstaining from giving quinine can do no serious harm to the patient in the vast majority of cases. It sometimes happens that the disuse of quinine in such cases for some days enables the diagnosis to be settled by parasites appearing in the finger-blood. Although we know that quinine is a specific in malarial infection, the fact that its use brings about the disappearance of pyrexial phenomena does not prove that the fever is malarial. Quinine is an antipyretic, apart from its plasmocidal properties. It is considered that as a routine practice no case of fever should get quinine until malarial parasites or other changes in the blood, or definite clinical manifestations, indicate that the case is one of malarial fever.

Papers have in recent years been published antagonistic to the prophylactic use of quinine, and in several reports the utility of this procedure is questioned. The failure of quinine as a prophylactic of malaria in the opinion of many experienced medical officers in India appears to be due to improper dosage, defective methods of administering the drug, postponing its administration too long, or using it in prophylactic doses when it should be given curatively; it would seem that usually the last-named is the cause giving rise to disappointing results, and it is probable that the ultimate defect will in most cases be found to be a want of completeness in the method of diagnosing actual cases of existing malarial infection. Prophylactic doses of quinine do little or no good when malarial infection is already present; they may possibly be instrumental in creating resistant strains of malarial parasites which perpetuate the infection in the individual, and thereby through him lead to dissemination of the infection.

Enquiry has elicited that in many stations the prophylactic issue of quinine is not commenced sufficiently early; for one reason or another the issue is postponed

until the incidence is seen to be rising rapidly. Under this circumstance, a fair percentage of men in barracks are already infected, and through anophelines infect one another. The cases where the infection is latent do not of course report sick, but they are reservoirs of the parasites that enable anophelines to disseminate the malaria. Prophylactic doses of quinine in such cases are, if anything, worse than useless; infection has already occurred, and curative doses are required; prophylactic doses possibly harden the parasites to the effects of quinine, and the reputation of the drug by this mistake suffers in two ways.

When all cases of malaria in units are admitted, and such admissions reach 2 per cent. of strength, it is considered that the prophylactic issue of quinine is justifiable. The longer it is delayed after this the higher will the percentage of fresh infections become during the malarial season. There are circumstances when a prophylactic issue should be made irrespective of the percentage of admissions, *e.g.*, in barracks where mosquito nets are not in use, and when there is a sudden rise in the malaria of the civil community around. Assuming a uniform distribution of cases in barracks, any greater percentage than 2 means that one man in each barrack is infected, and that through him in the presence of anophelines malaria will rapidly spread. Many instances could be quoted in which five or six men occupying parallel and consecutive beds in barrack rooms suffered from the same type of malarial infection, the other men escaping, and one instance in which 13 of 24 men in one room suffered from malignant tertian, the other 11 remaining healthy, and in the adjoining room 9 of the 24 occupants suffered from benign tertian, the other 15 occupants being unaffected by malaria in any form. Under ordinary circumstances, in non-epidemic years, however, such spreading of malaria does not occur through cases in the barrack-room of European troops, but through the infected anophelines from married quarters, bazaars and followers' huts invading barrack-rooms. The effect of the percentage of cases of infection in influencing the incidence of malaria may be seen in every endemic malarial station.

General experience appears to indicate that the best prophylactic dose of quinine during the malarial season, where malaria is comparatively mild, is 5 grains daily, where it is severe 5 grains daily for six days and 10 grains on the seventh day weekly, and where it is very severe, 5 grains for six days and 15 grains on the seventh day weekly. But upon the questions of dosage and the best method of administering prophylactic quinine, opinions even of experts vary widely; it is universally recognised that in practice a daily issue is no light undertaking.

Many factors interfere with the reduction of malaria in cantonments—indifference of the persons infected, want of enthusiasm of those guiding anti-malarial operations, absence of concentrated effort and of universal co-operation in the measures, and especially the absence of funds necessary to make these measures radically useful. All who are familiar with the difficulties inseparably associated with prevention in epidemic malarial cantonments must allow that it is always a heavy task from which there can be no remission.

Given a *limited* endemic malarial area to deal with, such as we have in most military cantonments in India, and unlimited funds, any trained tropical sanitarian would be able to formulate a scheme for the reduction of malaria. But these are conditions that are not in existence. He is the best military sanitary officer who can make most use of the practicable preventive measures at his disposal.

In the prevention of malaria in cantonments we should avoid counsels of perfection; we should employ as many of the known preventive measures as are practicable. The best anti-malarial results so far have been obtained in places where all preventive measures have been put into operation more or less simultaneously, and continued over a long period. Some anti-mosquito



campaigns have erred in dealing first with large or extensive and difficult projects instead of the cheaper and easier ones. The average malarial intensity of a locality depends on many factors, such as the number of children who harbour malarial parasites, the number of infected anophelines, extent to which individual prevention is practised, etc., so that the cause of the failure may not be always easy to ascertain. To get rid of malaria in any particular locality by artificial means may take several years. It is impossible to give the details of the measures to be adopted in all cases; these have to be determined by local circumstances; in some places all measures may be used, in others only a few are possible. In intensely malarial areas, in many cases, do all that is reasonably possible, and malaria is not mitigated; but such failures in cantonments should be rare if the foregoing preventive measures are systematically put into operation.

## THE PREVENTION AND TREATMENT OF MALARIA.

By T. S. ROSS,

MAJOR, I.M.S.

[The substance of a lecture delivered to the officers of the Hislop War Hospital, Secunderabad, November, 1917.]

FEW subjects (with the exception, of course, of "Operations for the Extraction of Cataract") have been so thoroughly discussed in medical meetings and journals in India as the prevention and treatment of malarial fever, and there would hardly seem to be anything left for discussion on the subject; yet, though there is nothing new in the following remarks, there are one or two points of the very greatest importance which have either been forgotten or are ignored by a large number of medical men in this country.

We all know, and I hope we all believe without any reservation whatsoever, that malaria can most certainly be prevented if we avoid being bitten by anopheline mosquitos. There are very few educated people in India nowadays who are not fully aware of this fact, but by the majority of them the prevention of mosquito-bites is considered either an impossibility or only to be attained by means that would render life a burden. Now the difficulty is not nearly so great as people imagine: anopheline mosquitos or at least the dangerous ones that are so frequently met with practically never bite in the day-time; this fact already reduces our difficulty by at least 50 per cent. A person who sleeps under efficient mosquito-curtains properly tucked in under the mattress all round, is effectively protected against malaria-carrying mosquitos, always presuming that his bed is sufficiently long and broad to prevent any part of his body pressing against the mosquito-curtain. Assuming that seven hours out of the twenty-four are spent in bed, our difficulty is reduced by a further 29 per cent. The remaining 21 per cent. of the twenty-four hours is the only period that need cause any

special trouble; this is the period between dusk and bed-time and in the case of very early risers the period also between the time of getting up in the morning and daylight. A few very simple precautions greatly minimise the risk of being bitten during these periods. "Anopheles" much prefers working in the dark; how few of us have ever seen an anopheles biting, even at night (with the exception of an occasional *rosii*)! The light of a lamp shining on the hands or face is usually sufficient to warn off the intruder though the part of the hands or face in shadow is liable to be attacked. Well-lighted rooms and verandahs are, therefore, of great assistance in warding off the mosquito. Everyone knows that the ankles are the mosquito's favourite point of attack, not because the ankles are specially "tasty," but because they are most often put away in dark places under tables, chairs, etc., and covered with socks and stockings of dark material so thin that the mosquito finds no difficulty in biting through it. The protection of the ankles is a simple matter; long trousers turned down at the ankles and lace-up ankle boots are a great protection during the evenings, but best of all are Wellington boots which seem to have been invented for the purpose. The wearing of shorts, low shoes, slippers, etc., during the hours of darkness is simply asking for malaria in a malaria-infected place. As protection for the hands and face and at times for the ankles, a "mosquitolene" made of equal parts of turpentine and eucalyptus, to which a little heavy oil like ground-nut oil and a little menthol are added, should be applied at dusk, and is generally effective until bed-time.

Using these simple precautions and without ever having taken a grain of prophylactic quinine, I have, during the last six years visited and stayed for some time in several of the most malarious parts of the Madras Presidency without ever contracting malaria, and it is certain that much malaria could be avoided by following these not over-laborious methods.

If the above precautions are carried out, I would not advise anyone to take prophylactic quinine, for, in the first place, if two lines of prevention are adopted, the chances are that neither will be carried out thoroughly, and in the second place, though it seems an extraordinary statement to make at this time of day, the value of quinine as a prophylactic for malaria has not by any means been proved. Little, if anything, so far as I am aware, is known of the life-history of the sporozoite between the time when it is injected into our tissues by the mosquito and its appearance in the red blood-corpuscles, and it is difficult to say what the effect of quinine on it may be during this period. It is marvellous that a drug which, as we all know, is an absolute specific against asexual malarial parasites, should

be open to any doubt with regard to its value as a malarial prophylactic; yet such doubt does exist in the minds of many people, medical and lay, who are quite competent to judge, and who have had special opportunities of forming an opinion. Certainly it seems to be a fact that when a person accustomed to the use of prophylactic quinine does develop malaria, develops a type of the disease exceedingly difficult to cure, either from the fact that he develops a strain of parasite resistant to quinine, or, as it seems to me more likely, his parasites quickly enter upon the sexual stage as a protection, and are, as a consequence, unaffected by quinine. I have in this way seen such unfortunate results follow the use of prophylactic quinine that I am very chary indeed about recommending the drug as a preventive.

With regard to the treatment of malaria, I would like to emphasise the difference between a fresh infection, that is, while the parasite is still in the asexual stage, and a chronic infection, when sexual parasites have appeared. In the former case the malarial parasite is easily and completely eradicated, that is, the disease is permanently cured, by a short course of quinine. Manson, in his "Tropical Diseases," says: "Ten grains (of quinine), preferably in solution, should be administered at the commencement of sweating, and thereafter five grains every six or eight hours for the next week. This is an almost certain cure." But it is extraordinary how often we find the patient kept on large doses of quinine, two or three times daily, for a month or even longer, though it is quite unnecessary to do so. I had a long series of cases of fresh infections, that I have been able to follow up, treated with ten grains of quinine morning and evening for the first two days, and thereafter with ten grains every night at bedtime for the succeeding ten days, not one of whom developed another attack within three months of the end of treatment, and who may therefore be considered cured. I of course insisted upon the patients taking the precautions already mentioned against the risk of re-infection. I feel certain that when dealing with fresh infections a prolonged course of treatment is only a waste of quinine, whilst the large doses so often given in these cases only worry the patient.

I have always used sugar-coated tabloids, and prefer administering them at bedtime, for quinine in solution in the early stages is liable to make the patient sick, and at any time the acid solution causes irritation of the stomach and dyspepsia, and if given in the morning or during the day, unpleasant buzzing in the ears; the sugar-coated tabloids, on the other hand, cause no irritation, and when given at bedtime any buzzing they may cause has always passed off by the time the patient wakes up in the morning—the patient, in

fact, takes the course of quinine without noticing any unpleasant taste or effect whatsoever; consequently no difficulty is ordinarily experienced in ensuring that the prescribed course of treatment is carried out when dealing with intelligent persons. I have never found that the sugar-coated tabloids escape solution in the alimentary canal, and as my experience in this respect seems to be exceptional, I can only suggest that it may be due to the bedtime administration.

The treatment of chronic malaria is an entirely different matter, and a case of malaria is chronic as soon as sexual parasites have appeared. I have no suggestions to offer with regard to the treatment of chronic malaria, except to say that a very prolonged course of quinine is necessary, that you will experience much disappointment, and that intramuscular injections often have the most beneficial effect. I may have been fortunate, but I have never seen any ill-effects follow intramuscular injections; the bi-hydrochloride should be used, and it is hardly necessary to add that the injections should be *intramuscular*—not subcutaneous—and that everything should be sterilized, including the quinine and the distilled water in which it is dissolved. This method of administering quinine may be unscientific and open to other objections, but the results in practice are often exceedingly satisfactory.

Furlough to Europe is, as it always has been, of the greatest value in chronic malaria, for in a cold climate the sexual parasites apparently develop asexual broods by parthenogenesis, the patient then gets one or more severe attacks of fever, takes his quinine and kills off these asexual parasites, and so gets completely rid of his malaria. It has been suggested that the transfer of chronic malaria patients to a sufficiently cold climate in India, say to the snows of the Himalayas, might have the same effect as furlough to Europe. I do not know how far this has been tried, but it certainly seems worth a trial, especially now when it is so difficult getting patients sent home.

With regard to malarial cachexia, I have, I suppose, been unlucky, for I have never seen a case recover where the condition was so advanced that the patient had developed marked œdema of the feet and legs; in such cases moderately large doses of quinine only hasten the end.

As I have said, there is nothing new in the above remarks; but the ease with which malaria may be prevented, and the certainty with which it can be cured in the early stage, cannot be too strongly impressed upon everyone. It is a very serious matter indeed allowing a patient to develop chronic malaria, though it is unfortunately too often the patient's own fault; as soon as he recovers, from his first attack of malaria, he

takes his quinine religiously for a few days, and then, feeling quite well, he forgets all about his medicine; in the course of a week or so he develops another attack, and the damage is done—sexual parasites have appeared, and the disease is chronic. Always make certain by microscopic examination during a first attack that you are dealing with a case of malaria, and then impress upon your patient, with all your power, the necessity of his carrying out your directions to the letter, and keep on reminding him at every opportunity during the ten days. Your microscopic examination result assures him that, however well he may feel, you could not have been mistaken in your diagnosis.

Having cured your patient, warn him, if he is still residing in the place where he got infected, that the chances are he will promptly get re-infected unless he takes reasonable precautions against the possibility of being bitten by mosquitos at night.

## HOW TO EXAMINE RECRUITS.

BY J. F. JAMES,

CAPT., I.M.S.,

*Lucknow.*

At a period like the present, when large numbers of recruits have to be examined all over India by medical officers inexperienced in this particular duty, many men are passed fit who at subsequent medical re-examinations are rejected. This may be due to a busy medical officer in civil service not having time to carry out a thorough examination himself, or to lack of system in examination.

19491—3 DMS—I of 1st October, 1917, gives comprehensive instructions about recruits' examination, but there are several tips which I have discovered by experience after dealing with thousands of recruits, which facilitate quick examination.

In the first place, examine recruits in batches. Thirty at a time is not an unwieldy number as soon as system is established. Don't collect enrolment forms. It merely means waste of time in distributing them again.

When a recruit is rejected, mark his enrolment form on the back as a guide for finally filling it in and to prevent the form being used again, as E. S. (enlarged spleen), H. (hernia), or whatever the cause may be, and place him apart; otherwise he may join the line again or appear another day. Always keep a basin of perchloride lotion at hand; this will diminish the risk of contracting scabies and other skin diseases.

Conduct the examination in the open with the recruits facing the sun, clad only in a loin-cloth, and their enrolment forms on the ground behind them. Examining recruits singly in a badly lighted room is a very tedious method. Walk up and down in front of and behind the line. Pick out cases of old age, poor physique, and fall them out. At the first examination other things may also be looked for. Men with trachoma or eye disease cannot face the glare, and either look down or keep their eyes half closed. Varicose veins, deformities, flat and barrel chests (in the latter case, ask recruit to cough and watch bulging of apices), skin diseases, etc. are often obvious, and the recruit may be either rejected at once, or put at one end of the line for special examination if any doubt remain.

About 50 per cent. of total rejections will be found to be effected at this first inspection. Lots of things will catch the experienced eye. An abdomen will suggest enlarged spleen and a touch will reveal it: complexion will suggest anæmia and a look at the tongue will confirm it: appearance may suggest idiocy or deafness and this is quickly proved or disproved.

The more particular examination I conduct as follows, and here it is important always to adhere to whatever sequence is adopted. Personally I do spleen, teeth, tongue, eyes, movements, heart, lungs, eyesight, identification marks, private parts, filling in forms.

*Spleen.*—From left to right of the line. Do not warn recruits to keep their abdomens slack. In the effort to do so they usually take a deep breath, expanding their chests and retracting their abdomens. The practised hand, with the recruit standing naturally, will give a sense of resistance immediately if the spleen be enlarged. If the recruit keeps his abdomen hard, get another who keeps his soft, and take him down the line as a pattern for the others to see.

From the right of the line go back examining teeth—about 75 per cent. of recruits have pyorrhœa, usually most obvious in the lower incisors. Next make every recruit put his tongue out.

The tongue is the part to show anæmia, and is much more trustworthy than the conjunctivæ.

*Eyes.*—Watch for men who have difficulty in facing the sun. Pick up the upper eyelid between the finger and thumb, and look underneath it for scarring and trachoma. Few cases need the lid completely everted. At the same time glance at the cornea for opacities.

*Movements.*—The S. A. S. or W. O. stands in front facing the line and does them himself. Both arms fully extended, palms up. Walk down the line and examine hands for contractions and deformities. Adduct the thumb across the palm

and clench the fist; other movements are full adduction of arms, circumduction and flexion of elbows and wrists.

Next look for bad case of flat foot, and make all recruits rise on their toes and hop forwards on one foot and backwards on the other, sit down and rise quickly, and finish this part of the examination with all recruits touching their toes, with knees kept straight. This opportunity may be taken for examining for varicose veins when walking along behind the line.

Next make your recruits run two or three hundred yards. Start them off to go around a certain mark, such as a tree, and as they come in, note anyone distressed or coughing for special examination. Running I regard as a great test of fitness.

Next with a stethoscope examine the heart. Heart disease is fairly common amongst hillmen, irregular action among plainmen; but unless the recruit seems very breathless, I do not consider much attention need be paid to the latter.

Go down behind the line and listen to the lung base. Cases of asthma are fairly common, and can be spotted by the shape of the chest and auscultation.

At the same time as this part of the examination is being carried on, face your line round with their backs to the sun, and let the S. A. S. test eyesight by walking down the line at a distance of ten feet with the test card. Make each recruit cover first one eye, and then the other, with the palm of his hand. Avoid being deceived by the recruit peeping through his fingers, or the ward orderly, while covering the eye with a sheet of paper, whispering the number of dots to the recruit; or his neighbour may assist him in the same way.

Next take a piece of chalk and note identification marks, putting a circle round them or a stroke near them. This saves searching for suitable marks later when filling up enrolment forms. Incidentally, choose marks easy to describe and definite. Most men have scars on the forefinger due to cutting themselves while chopping wood, etc. Scars on the shin are very common. Take the face first, as marks on this part are easy to describe. For instance: " $\frac{1}{2}$ " scar 1" above right eyebrow; mole left nostril; 2 annas size scar 1" outside right angle mouth," are all definite marks; while "mole left cheek, scar on forehead, scar front right shin" are not definite marks. Three marks must be noted and are often difficult to find.

*Examination of the private parts.*—Each recruit picks up his enrolment form and passes the medical officer in single file. This part of the examination is usually resented as much by the M. O. as the recruit, who is amazingly coy and objects to being parted with his loin-cloth most strongly. He appreciates a screen or wall behind the examiner, so that he is not exposed to the public

gaze. Sit in a chair with a basin of perchloride lotion handy. The recruit accompanied by the ward orderly toes a line at a suitable distance. He holds up his loin-cloth and the fingers are passed over both groins to detect gland over the cords down to the testes, under the urethra for pus discharge, and then, while the ward orderly holds something in front of the recruit's face (otherwise he will cough over the examining officer), he coughs during the examination for hernia or bubonocoele. He then passes along to the S. A. S., who examines for piles.

It only remains to examine the recruit's intelligence and hearing, if defects in them have not been already discovered, and this can be done as the recruit comes up to have his form filled in, asking his name and father's name first, to test his hearing, and to check his papers which he may have exchanged with some one else and enquire whether he has ever been ill. Any hoarseness of the voice calls for an examination for syphilis; finish by writing the identification marks.

The average time taken to examine each recruit by this method works out at about three or four minutes. Examined singly they take nearer ten. Also with a definite method and order of examination small points are not so liable to be missed as when recruits are examined haphazard. Incidentally, the recruit is under observation for above an hour when they are examined in batches. There are probably many quicker ways of examining recruits, but I have found this most satisfactory. An examination such as is done for life assurance with urine examination and an exhaustive search for signs of T. B. is not practicable. If he has Bright's Disease he will probably show it by cedema, and T. B. is suggested by long eye-lashes, emaciation, and flat chest.

The recruit, too, must always be taken as a whole. Slight varicose veins, or slightly enlarged spleen, would not render a big strong recruit unfit, while with a man of poor physique, it might just turn the scale against his acceptance. In the case of the former, always note in his sheet that this defect has been found.

A common method of rendering a man unfit is to present him with a monetary reward before he is finally passed fit. Deafness, idiocy, violent abdominal pain, histories of previous attacks of epilepsy and various other ailments are often developed after the recruit has received Rs. 10. Old men are as a rule useless on service. I have seen a large number of doddering grey beards returned from France and elsewhere. Careful and systematic examination of recruits saves much subsequent annoyance, hours of time, and large sums of money, besides being of vital importance to the army's efficiency.

## THE LAYING OUT OF A LARGE MILITARY CAMP.

BY C. C. MURISON,

MAJOR, I.M.S.,

*Commanding No. 25, Combined Field Ambulance.*

THE laying out of a large military camp in a systematic manner, so as to reduce the nuisances which exist in all camps to the minimum, is very important not only from a comfort but also from a sanitary point of view. As nothing regarding this is laid down in the several books on camp sanitation and regulations, I am bringing the following few notes to the notice of military medical men, in case some of them, in the future, have to give their opinion on this subject.

It will have been noticed that very often large military camps are not laid out in a systematic manner, with the result that officers' cook-houses and messes and men's cooking places of one unit are within an unpleasant and short distance of latrines and incinerators of another unit, and owing to the unsystematic laying out of the camp, it is very difficult for the former unit to get a place for cooking and messes away from latrines and incinerators of the several other units encamped round it.

All large camps, within a very short time, become permanent owing to the construction of latrines, incinerators, cook-houses, huts, and also of matting over the tents, with the result that the camp cannot be relaid out without incurring a great deal of labour and much expenditure.

Consequently, it is very necessary, before starting the laying out of a large military camp, to know the direction of the prevailing wind of the place. This information should be given in all books of intelligence.

It is not the rule, but it will be found that every place has, in addition to the prevailing wind, a wind which blows, more or less, in the opposite direction to the prevailing wind. To prove this statement, I mention the following examples :—

1. Land and sea breezes in places along the sea-coast.

2. South-west monsoons and north-east monsoons in India.

3. Kharif (South-west) and a north-east wind in Somaliland.

4. Shimal (North-west) and a south-east wind in Mesopotamia.

All roads should be wide and constructed either parallel with, or at right angles to, the direction

of the prevailing wind, and each square of ground formed by the respective roads should be of sufficient size to comfortably encamp a regiment, or a large unit, and also have room to spare along the roads.

The object of constructing roads parallel with the direction of the prevailing wind is that all the departments of a unit giving rise to nuisances should be placed along these roads, so that all smoke, gases, and smell which do not rise up will be blown along these roads, and thus these nuisances will be reduced to the minimum.

On referring to diagram A, the plans respectively of the whole camp, as well as that of a regiment, will be readily seen. It will be noticed in this diagram that all latrines and incinerators are along separate roads to those along which cooking places are situated, and, further, the incinerators of four units are grouped close together. It is certainly open to objection to have cooking places near roads, but beyond

DIAGRAM A.

1. Incinerator.
2. Men's
3. N. C. O.'s } Latrines.
4. Officers' }
5. Regimental animals.
6. Men's
7. N. C. O.'s } Urinals.
8. Officers' }
9. Soakage pits.
10. Men's
11. N. C. O.'s } Bathing Places.
12. Officers' }
13. Guard Tent.
14. Living Tents.
15. Canteen.
16. Men's Dining Tents.
17. N. C. O.'s Messes.
18. Officers' Mess.
19. Canteen
20. Men's
21. N. C. O.'s } Cooking Places.
22. Officers' }

placing them as far away as possible from latrines and incinerators, this arrangement cannot be avoided, as all units for military purposes must have a road round their camp. The objection to dust falling into the food can be greatly reduced by water from the bathing places being sprinkled on the roads along which cooking places are situated.

All units with a large number of animals should be given camp sites leeward of the other camp sites, and the animals of these units should be kept leeward of the men and as far away as practicable.

Tents and huts should be put up, so that their length is parallel with (diagram B), and not at right angles (diagram C) to, the prevailing wind,



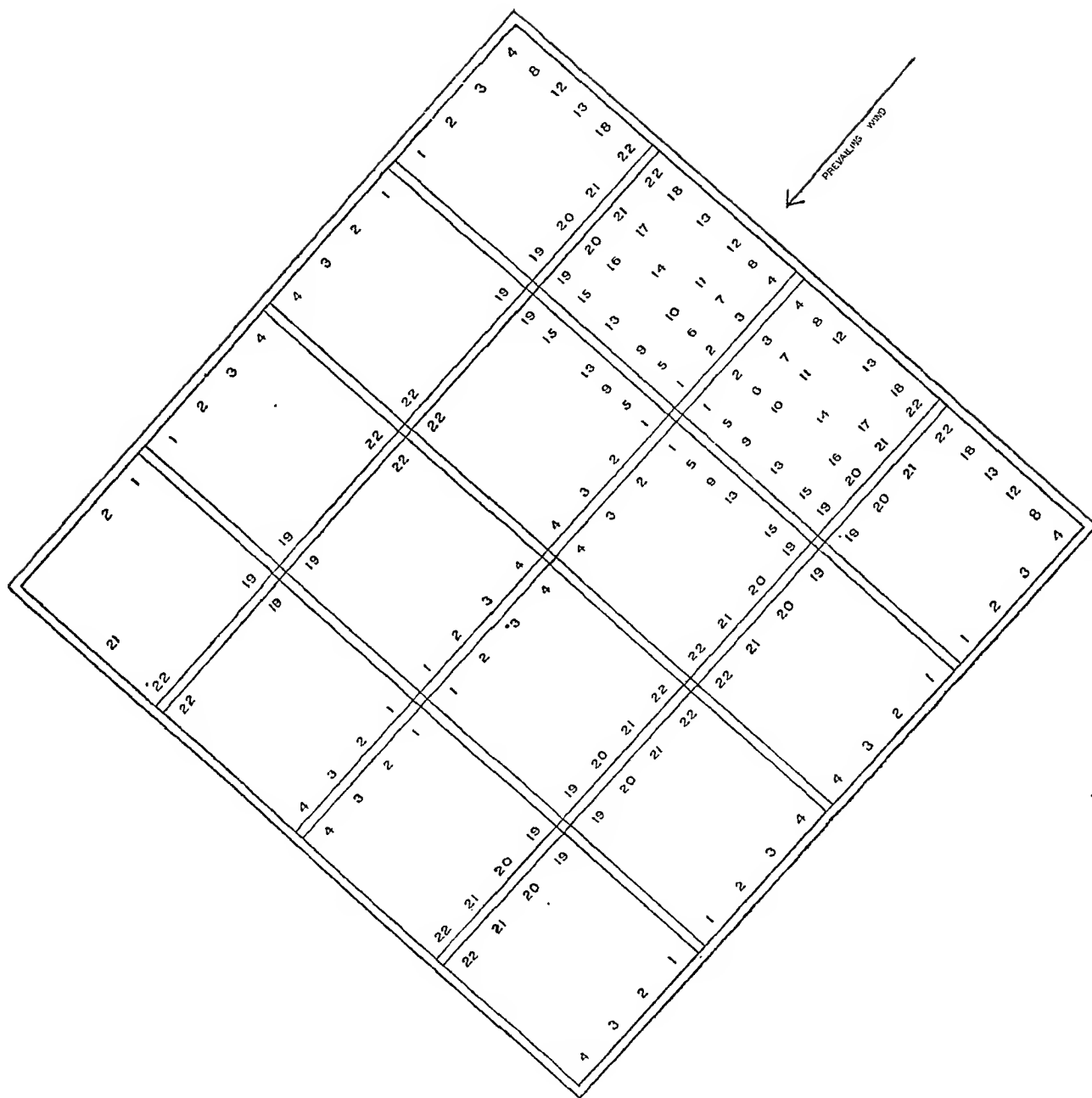


DIAGRAM A.

HOW TO LAY OUT A MILITARY CAMP.

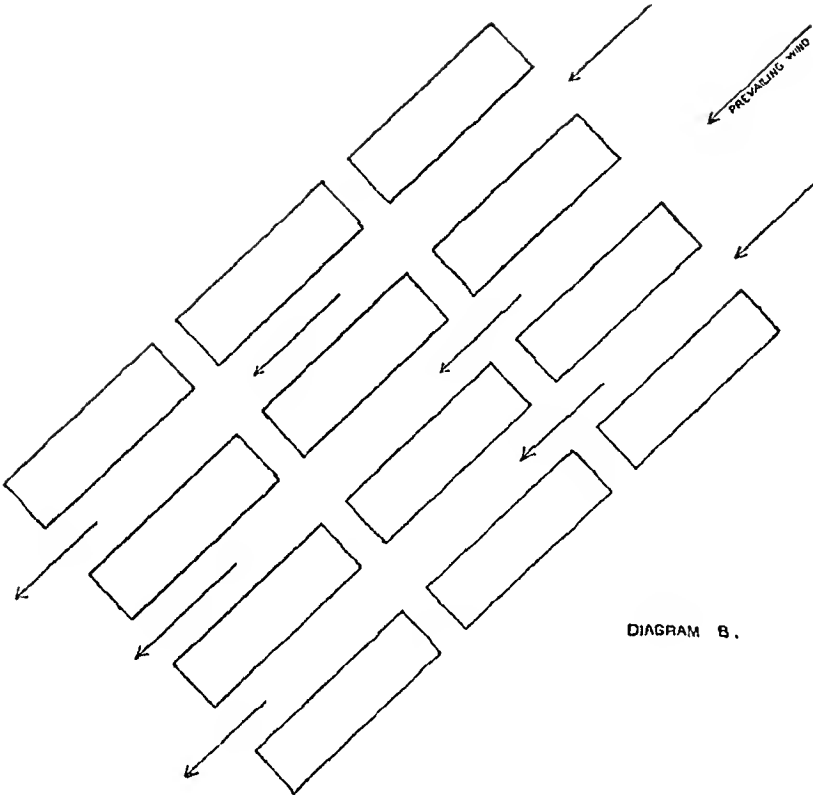


DIAGRAM B.

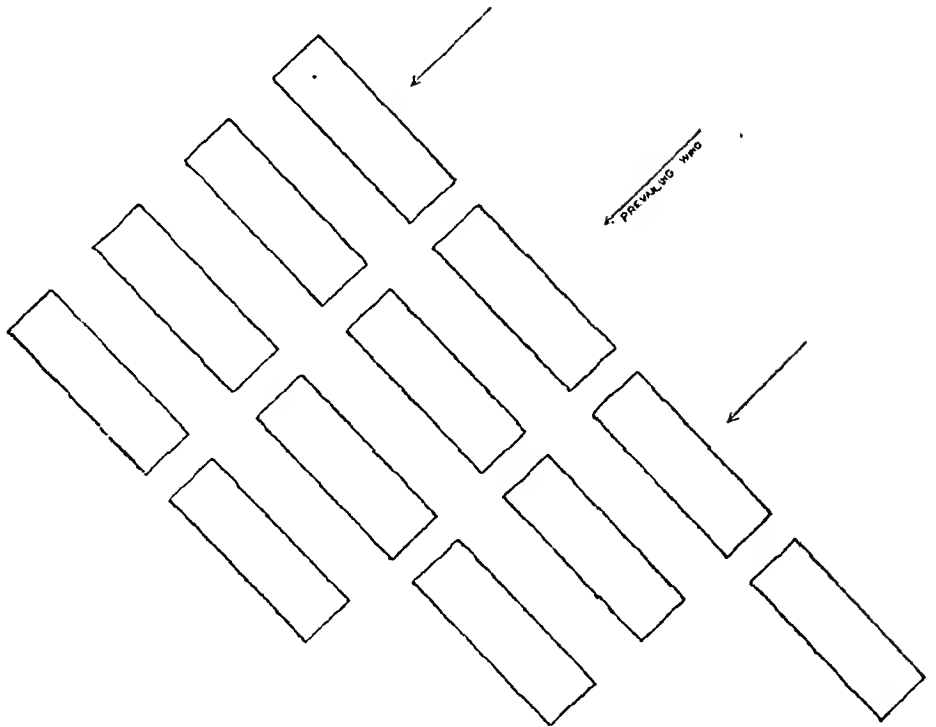


DIAGRAM C.

HOW TO LAY OUT A MILITARY CAMP.

so as to allow as much wind (or breeze) as possible to blow through the several camps in order to get to the camps situated towards leeward of the main camp.

All slaughtering places and litter dumps with incinerators for them should, if possible, be a long distance to leeward of the main camp.

The above remarks do not apply to small or perimeter camps.

## A Mirror of Hospital Practice.

### NON-OPERATIVE TREATMENT OF CARBUNCLES AND BOILS.

BY DR. K. J. DIKSHIT, M.R.C.S., L.R.C.P.,

*Surgeon to J. A. Hospital, Gwalior.*

As boils are very common in the summer in this part of the country, and to operate on each of them is so irksome, owing to their tendency to being too many in number and to come out in crops, I had to think of a non-operative treatment for the same. I had read of glycerine poultice, and also of Bier's treatment. For the former method, the epithelium of the skin must be eroded to enable it to act. This in itself is painful owing to the tenderness; besides, the action is not quite as quick as the patient would hope for, not to say of the mess one experiences in applying it and the trouble in keeping the bandage on those parts of the body where boils are common, namely, the face and the back. I therefore tried the latter method, *i.e.*, the Bier's treatment, for five minutes on each boil or a crop of these that could come within a cup. I used the special cups with rubber bulbs attached to them, and I found that within a couple of days all those that were thus treated subsided altogether, those that had formed a core already healing by letting it out, while others aborted straightaway. This way I had an opportunity to try on many patients with uniform success.

In the summer of 1916, I came across a diabetic patient about forty years of age, with 18.5 grains of sugar per ounce in his urine, having multiple boils on his back, one carbuncle about the size of a crown on the nape of his neck, and another about a rupee size over the right shoulder. Both these had advanced so far that they had multiple openings with thick slough at the bottom, and much induration around. According to the usual method of treatment for carbuncles at this stage, I advised him operation to remove all the dead tissues after a crucial incision. He submitted to this

after some deliberation, but before he had taken a little chloroform, he asked to stop further anaesthesia, at once refusing to submit to it any more, owing to the feeling of suffocation, and could not be persuaded under any circumstances. Having therefore had to abandon the operation, I had to think out a non-operative treatment, and thus had a chance to try what I had found successful in boils. Though it is mentioned in Rose and Carless that "in early stages Bier's treatment by induced hyperaemia may be successful in preventing suppuration, but where the organisms are at all virulent or the focus large it will probably fail," I took a rather large size of Bier's cup, such as would cover the whole of the indurated area, and commenced my treatment beginning with five minutes for each carbuncle and increasing the time to half-an-hour gradually. On the first day on applying the cup only blood was sucked out. After its removal, I ordered glycerine poultice to be repeated every second hour. The method of application of this poultice, I believe, must be known to everyone, but for ready reference I am taking the liberty to write it down. A double layer of a piece of lint of the size of the carbuncle to be treated is soaked in glycerine and applied over it, and then covered with oil silk, half an inch bigger on every side than the lint, to avoid glycerine being soaked into the dressings that are applied over it. Each time that the poultice was changed, there was lot of thick pus collected underneath it. The very first night of the treatment the patient had hardly any pain and had a good rest. On the second day of the treatment, when the cup was reapplied, instead of blood came out a lot of pus and some sloughs too, leaving a cavity of some size with a biggish hole. This cavity was filled with glycerine, and over it glycerine poultice was again ordered out as before. This was required to be continued for a fortnight, within which period, the carbuncles healed up totally. On the fourth day of the treatment all the induration had disappeared, no more sloughs left out, and the discharge also become much less. Concurrently the boils of the patient were also treated with the Bier's method and cured. Since this patient was a diabetic, he was given codeine also all the time he was under treatment for carbuncles and was also on restricted diet.

The next patient that I got a chance to try was a schoolmaster aged about 60 years, who could not afford to stay away from his work and be operated on. His urine was free from sugar. He had it on the back about 4 inches by 4 inches in size, over which even the largest size of the Bier's cup wouldn't fit. I had therefore to improvise it by taking a glass funnel and attaching to it the bulb of the Bier's cup. This served the purpose quite well, and the patient made an uninterrupted recovery in a month's time, having had no more

pain from the very first day of the treatment and not been required to lay up in bed even for a day.

The third case was that of a mechanic, 30 years of age, also not diabetic, with a carbuncle about a rupee in size on the back. This healed up in a week's time.

These three cases, I know, are too few to give any definite opinion in favour of this method of treatment, but my only excuse for publishing them is to draw the attention of other medical men, and to know through the medium of your paper if others also have had a similar experience, or if not if they do try it, to know the results they meet with.

### THE INJECTION OF LYMPH AS A PROTECTOR AGAINST SMALL-POX.

By C. F. FEARNSIDE, M.A., M.B.,

LT.-COL., I.M.S.,

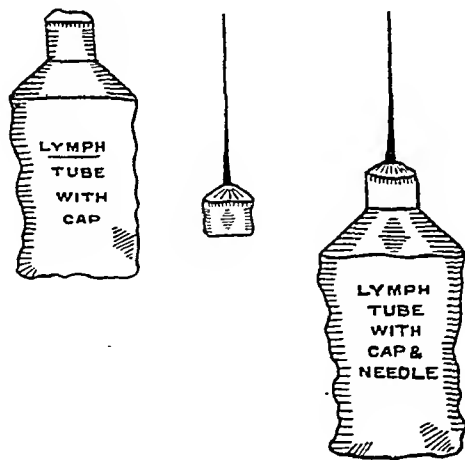
*Medical Superintendent, Central Jail, and District Medical and Sanitary Officer, Coimbatore ;*

AND

S. GOPAL POI,

*Sub-Assistant Surgeon.*

The vaccination results in Coimbatore district during many years past have been unsatisfactory, and many explanations have been put forward to explain it away. One of the chief causes we consider to be the disinclination at all times of the women to have their children vaccinated and immediately after it has been done they remove the lymph from the scarified area on the arm. Opposite the out-patient department in the Municipal Hospital, Coimbatore, is the vaccination



room where an experienced vaccinator carries on his work. We have seen ourselves women removing the lymph from the infants' arms even before

they had reached the hospital gate. Needless to say, the results were negative. The same thing happens amongst the prisoners in the jail, where every prisoner has to be vaccinated on admission. It was therefore of importance to put this out of their power, and the following means was adopted with very gratifying results.

The lymph is delivered by post from the Vaccine Depôt at the King's Institute, Guindy, in small leaden tubes with a cap having a standardised thread.

To a spare cap we soldered an ordinary hypodermic needle, and after sterilising the cap and needle it was screwed on to the tube containing the lymph after removal of the protecting cap. The lymph can then be squeezed through the needle.

The arm of the recipient is next pinched up after touching the skin with iodine and the needle inserted under the skin as in an ordinary hypodermic injection. Four insertions are made, a little lymph being squeezed each time and the opening touched with tincture iodine.

Below is a comparative statement of the two methods of vaccination, which certainly favours the injection process.

| RESULTS OF SCARIFICATION.     |                                | RESULTS OF INJECTION.       |                 |                 |                   |
|-------------------------------|--------------------------------|-----------------------------|-----------------|-----------------|-------------------|
| Years.                        | Average percentage of success. | Period.                     | No. vaccinated. | No. successful. | Success per cent. |
| 1914-15<br>1915-16<br>1916-17 | 53.80<br>63.82<br>67.11        | September to December 1917. | 808             | 663             | 82.05             |

There is the usual focal reaction lasting the usual time, but no superficial vesiculation except where the needle has scratched the surface of the skin.

To prove that the method is successful, we vaccinated 12 persons who had been inoculated with the vaccine by injection; by the ordinary method of scarification all were negative, which proves that this method is quite protective.

Its main advantage is that the lymph cannot be rubbed off. In leaving no marks it is impossible to tell whether a person has been vaccinated or not—a boon to ladies who abhor the vaccination marks on their arms; and it is a cleaner and more rapid method of manipulation.

Interested persons might give this method a trial. It has been so successful that the injection of lymph is being continued.

## The Combined Treatment of SYPHILIS

## SUPSALVS

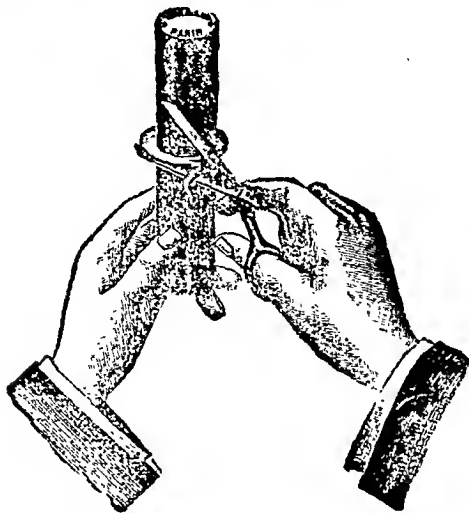
STABLE SUPPOSITORIES OF  
"606" (of French Manufacture)

FIG. 1.

Fig. 1 represents the special patent metallic envelope containing a Supsalv for hot climates. The projecting edge in the middle is cut by scissors—the two ends are then easily pulled apart. The envelope should first be immersed in cool or iced water for 10 minutes.

At the International Congress of Medicine Ehrlich stated that the biochemical action of "606" on spirochaetes is not direct but indirect, a third factor found in the body fluids being necessary.

This success is explained by the well-known experiment of Levaditi: "If living treponemas be placed in a solution of Arsenobenzol (Ehrlich's 606) they continue to live in it. But if a trace of extract of liver be added to the mixture the treponemas are destroyed."

"If 606 has to be taken up and transformed by the liver in order to become toxic to the treponema, there is no better mode of absorption of the drug than by way of the intestine, since all the veins of the intestines join the portal vein. If this be the case no route could be more indirect and more unsatisfactory for active treatment than one that is not intestinal or not intravenous (i.e., prehepatic), since some of the drug must necessarily become fixed everywhere before the passage through the liver has activated it."—Dr. Sabouraud, La Clinique (13-4-1913).

As a result of numerous clinical experiments, Dr. Bagrov, of Moscow, has arrived at the same conclusion, and recommends the rectal method of administration of 606.

**200** cases were treated by the combined treatment in one of the London hospitals. In each case a negative reaction was attained.

Extremely Simple in  
use.

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Most Satisfactory  
Clinical Results.

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**CHEMISTRY.**—"Mersalv" contains 10 per cent. metallic mercury, which by a special mechanical process exists in the minutest state of sub-division possible. It is a non-greasy preparation, and, in contra-distinction to other mercurial preparations, contains no organic fats or oils. "Mersalv" is of a white creamy consistence, of pleasant odour, and cleanly in application.

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IODOGÉNOL is a preparation containing Iodine in an organic, assimilable and one might almost say "living" form.

IODOGÉNOL possesses about 38 times the physiological activity of that of iodide of potassium: this preparation has, according to the clinical reports of eminent professors, succeeded where the usual iodide treatment had failed after producing undesirable by-effects.

IODOGÉNOL does not produce Iodism or other bad symptoms.

IODOGÉNOL is an undoubted digestive stimulant and promotes appetite and has a markedly beneficial effect on the general nutrition. It has been tried in many of the large hospitals, and given highly satisfactory clinical results in cases of

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of Tuberculosis, General Debility, etc.

20 minims of IODOGÉNOL are equivalent to 8 grs. Iodide Potassium.

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Sulphur administered in this form by the digestive tract is entirely absorbed (90% in worst cases and 100% in others).

Biosulfol gives beneficial results with which ordinary Sulphur medication, owing to its being only in a small part assimilated, cannot compare.

## INDICATIONS:

Chronic Affections of the Pharyngeal and Bronchial  
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Chronic Affections of the Genital Mucous Membrane.  
Chronic Rheumatism (Polyarthritides deformans).

Various Affections of the Joints.

Intestinal Intoxication.

Skin Diseases.

Mercurial and Lead Poisoning, etc.

## DOSAGE:

Biosulfol is prescribed in a one-teaspoonful dose, to be taken during each of the two principal meals, pure or in water or milk. It is quite palatable.

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Antipyrin, Phenacetin, and Pyramidon  
superseded.

## CRYOGENINE

LUMIÈRE.

**NON-TOXIC. EFFICACIOUS. HARMLESS.**

Adopted by the French Ministries for War and the Navy, also by the Poor Relief Board. Papers on "Cryogenine" have been read before various Medical Societies by over 90 of the most eminent Continental Medical Men. In each paper clinical results of the most satisfactory character are recorded. "Cryogenine" is a white crystalline powder, odourless and almost tasteless; its chemical composition is Metabenzamido semi-carbazide.

Cryogenine has a high reputation as a

**GENERAL ANTIPYRETIC and POWERFUL ANALGESIC.**

FORMS.—Tablets, Pills and Powder.

LANCET, Dec. 18th, 1909, p. 1812: "..... The above case is one out of a number of successful results obtained from the use of this remedy (Cryogenine) contrasted with Pyramidon, which certain writers regard as the best drug for phthisical temperature. I think there can be little doubt 'Cryogenine' is the safer and more efficacious antipyretic....."

J. E. G——, M.D.

**A Great Advance in the Treatment of BURNS—Slight or Severe.**

## AMBRINE

(Method of Dr. BARTHE DE SANDFORT.)

AMBRINE instantly alleviates pain.

Promotes rapid healing.

Forms a sure protection against infection of the Wound.

Although the dressing with AMBRINE is seclusive and adhesive, it becomes after a short period non-adhesive, and can be removed without pain, hæmorrhage, or injury to the newly-formed tissues. The healing takes place without leaving scars or contractions.

Supplied to

The British Navy. British Red Cross.  
Many Ordnance and other large Works.  
The French Ministry of War and Marine.  
The French Red Cross. The Italian,  
Belgian, and Rumanian Governments.  
The French Railway Companies. The  
Carnegie Trust Company, U.S.A., &c.

### INDICATIONS:

|           |            |                 |
|-----------|------------|-----------------|
| BURNS     | CHILBLAINS | VARICOSE ULCERS |
| NEURALGIA | SCIATICA   | NEURITIS        |
| PHLEBITIS | RHEUMATISM | GOUT, &c.       |

The British Medical Journal, Sept. 2nd, 1916.

Re AMBRINE TREATMENT.

"..... The primary and quite incontestable advantages of the treatment are two: it is agreeable to the patient because entirely painless; it is convenient to the surgeon because easily and quickly applied..... It is possible that the treatment would be useful in dealing with ordinary ulcers and in any case it is certain that the study of its application to the raw surfaces is worth pursuing...."

The SCIENTIFIC TREATMENT of HAY  
FEVER and allied ailments.

## KINECTINE

According to Dr. MOUNEYRAT, the discoverer of  
Galyl and Hectine (the widely adopted Salvarsan  
Substitutes).

### FORMULA:

*Chlorhydrate of Quinine c. Hectine—i.e., Benzo-sulfone-  
para-amino-phenyl-arsenate of Quinine.*

Non-toxic, produces no ill-effects.

Easily taken (tablets) and well tolerated.

Highly satisfactory clinical results:—

AS A PROPHYLACTIC AGAINST HAY FEVER, &c.

RAPID ABORTIVE ACTION IN THE INITIAL  
STAGES.

CURATIVE ACTION IN THE ADVANCED AND  
CHRONIC CONDITIONS.

## NEOCAINE-SURRENINE

Neocaine is a synthetic product of French  
manufacture.

**A Perfect COCAINE SUBSTITUTE of  
Low Toxicity.**

**A White Powder, readily soluble in water.  
Analgesic power, duration, and rapidity  
of action quite equal to Cocaine.**

**Toxicity less than one-sixth.**

**Therapeutical effects identical with Cocaine (except-  
ing as an exhilarant) for Dental or Surgical  
local and Spinal Anæsthesia, Lozenges,  
Snuffs, Ointments, &c.**

### Composition of Neocaine-Surrenine:

|  |     |     |          |
|--|-----|-----|----------|
| Pure Neocaine                          | ... | ... | 5 c.g.   |
| Acid Borate of Adrenalin<br>(Takamine) | ..  | ... | 0.1 m.g. |

Pure Neocaine is also supplied.

FORMS.—Powder in capsules and phials. Ready prepared  
solutions in Ampoules (various percentages), and  
Ampoules of sterilised liquid for making solutions.

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# IODARGOL

Special Colloidal Iodine.

**NON-TOXIC  
PAINLESS**

**FOR THE TREATMENT  
of Gonorrhoea: Acute and  
Chronic. Urethritis: of  
Old Standing.**

**DIFFUSIBLE  
ANTISEPTIC  
ANALGESIC**

Cystitis and the Serious Complications of Gonorrhoea.  
In Ampoules and Phials for Injection or Soluble Bougies.

## FOR GYNÆCOLOGY OVULES

**UTERO-TOPIQUE**  
**IODARGOL.** Direct Intra-  
uterine Medication.

These are introduced into the vagina and slowly discharge the Iodine which penetrates deeply into the vaginal mucous membrane, giving rapid relief from congestion and pain. Destructive to the micro-organisms.

As a wound dressing Iodargol on account of its antitoxic and dermoplastic action prevents or ameliorates the fever due to infection, cuts short suppuration, eliminates the sloughing portions and cleans the wound, at the same time stimulating epidermisation and cicatrization.

**IODEOL OVULES** for Vaginitis, Metritis, etc.

**IODEOL CAPSULES** contain 4 grains of Iodine in each. Never cause Iodism.

*More powerful and active than Iodine and without its drawbacks.*

New Complete Gynæcological Dressing

# TAMPOVULES

A soluble ovule combined with a Vaginal Tampon

1. The method is strictly aseptic, and offers to the practitioner every guarantee, the cost being no higher than that of any of the well-known brands of ordinary ovules.

2. The ovule and the tampon requisite for keeping it in place are applied in a single manipulation. The ovule can be applied to the selected point very readily.

3. The ovule is kept at the level to which it has been introduced during the whole of the time necessary for its solution, and, consequently, the active principles that it contains are utilized to their fullest extent.

4. Owing to its more prolonged sojourn in contact with the mucous membrane, the action of the drug is more energetic.

The base of the ovules consists of selected sterilized gelatine. The tampon is soldered to the ovule and consists of sterilized cotton-wool covered by sterilized gauze. It may be impregnated with active substances which render the dressing more efficacious.

The following Tampovules are kept ready in stock; but we are prepared to supply similar dressings according to any prescription our medical clients may desire.

|                       |                      |
|-----------------------|----------------------|
| Tampovules containing | Argyrol.             |
| "                     | Collargol.           |
| "                     | Hamamelis (Extract). |
| "                     | Ichthyol.            |
| "                     | Iodoform.            |
| "                     | Resorcine.           |
| "                     | Copper Sulphate.     |
| "                     | Zinc Sulphate.       |

In Boxes containing six Tampovules.

# URASEPTINE

**The Most Powerful and Effective  
Urinary Antiseptic.**

**URASEPTINE** is a granulated product entirely soluble in water, its bases being Piperazine, Urotropine, Helmitol, Benzoates of Sodium and Lithium. It contains 60 centigrams (10 grs.) of active matter to each teaspoonful.

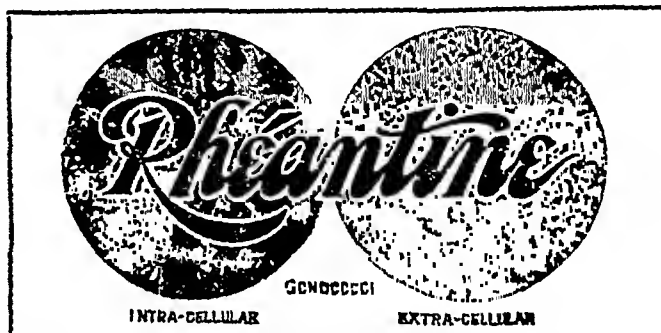
**DOSE.**—2—6 teaspoonfuls daily.

It purifies the Urine, and this action is due to its three principal properties:

1. It is a **URINARY ANTISEPTIC.**
2. A **SOLVENT OF URIC ACID** and of **PHOSPHATES.**
3. A **MILD NON-TOXIC DIURETIC.**

**INDICATIONS.**—Arthritism, Gout, Gravel, Hepatic and Renal Colic, Rheumatism, Calculus, etc., Phosphaturia, Urinary Antisepsis, Pyelitis, Bacteriuria, Cystitis, Prostatitis, Urethritis, Pyuria, Urinary Abscess, Vesical Catarrh, etc.

## ANTIGONOCOCCIC



The clinical reports given by various doctors show that Rhéantine gives highly satisfactory results, both in acute and chronic forms of Gonorrhoea and also in the various infectious complications due to Neisser's bacillus.

Rhéantine is put up in hermetically sealed tins, containing 28 spherules. Dosage.—4 spherules a day.

Therapeutic Association of Paris (14th June, 1916) the result of their observations:—

"It is not a rare thing," write these authors, to observe in the very first days a more or less marked recrudescence of the discharge. This negative phase, which, however, is temporary, is always followed by a well-defined positive phase, in the course of which the characteristics of the urethral pus undergo a rapid change; the discharge, which is at first thick, abundant, and creamy, passes gradually into the hyaline state, diminishes in quantity, and in the majority of cases ceases.

"Under the microscope these successive stages are demonstrated in equally definite stages; whatever may have been the duration of the disease, the characteristics of the pus become rapidly modified; after two or three days' treatment the gonococcus, first intracellular, becomes exterior; it ceases to act as a parasite on the polynuclear leucocytes and the large epithelial cells—one then finds them disseminated outside the leucocytes.

"Finally, some days later, if the administration of Rhéantine is continued, the condition undergoes still further change, the gonococci become agglutinated, arranged in a mass, and finally bacteriolysed."

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# SERUMS

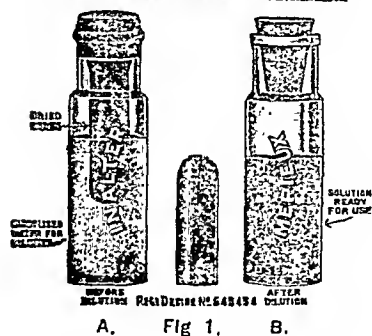
OF THE MERIEUX INSTITUTE, LYONS, FRANCE.

Prepared under the immediate supervision of M. Merieux (late of the Pasteur Institute) by the most approved modern scientific methods.

## INALTER VIAL

### DIRECTIONS:

Fig. 1, A. represents the "INALTER" Vial—with U tube inside containing 1 gramme of dried serum and 9 c.c. carbolised water (1 gramme dried serum = 10 c.c. liquid serum). The rubber plug which seals the Vial and the U tube is withdrawn and after the contents of the tube have been emptied into the solution, the plug is replaced in Vial, and the contents quickly dissolve. The freshly prepared serum is now ready for use as in Fig. 1, B.



### ADVANTAGES

The contents keep indefinitely.

Ready for use whenever required.

The preparation of the Serum is speedy, simple, and perfectly aseptic.

The freshly prepared Serum has full potency and activity.

The Inalter Vial can be supplied with:—Serum Antistreptococcus—Antitetanic or Antidiphtheritic.

## THE MEDICAL TREATMENT OF CANCER.

# CUPRASE

CUPRASE is a colloidal copper hydroxide which is obtained chemically by the reduction of salts of copper in the presence of albuminosic acid.

As a result of over ten years' research work on Cancer, Dr. Gaube du Gers produced a new Colloidal Copper Hydroxide which has given remarkable results in *arresting the progress of the disease*, with loss of pain, and great improvement in the general condition of the patient.

This treatment has passed far beyond the experimental stage. The numerous clinical reports from Doctors of repute in various countries, give cases of great variety. In all of these *pain has been eliminated*, and in a great percentage cures are claimed; in no instance any undesired effects.

*Extract from Proceedings of the Royal Society of Medicine, February, 1913.*

Dr. George Herschell, comparing electric and chemical colloid copper, stated: ".....Chemical colloid appears to give the best results. In the following cases chemically prepared colloid was used. Experimentally it has been proved: (1) That particles of colloid copper can be demonstrated in the granulations of cancerous growths after two or three injections of the colloid; and clinically (2) There is invariably great relief from pain; (3) Appetite and strength return and the patient puts on flesh; (4) There is in many cases a diminution in the size of the tumour; (5) The injections are absolutely non-toxic, although in many cases an inflammatory reaction is manifested in the cancerous growths.

"As regards my own personal experience in the use of this method of treatment in addition to my own cases, I have had an opportunity of observing the effects in the practice of some of my medical friends, and in nearly all cases the progress of the disease appeared to be arrested."

SAMPLES ON REQUEST. LITERATURE ON APPLICATION.

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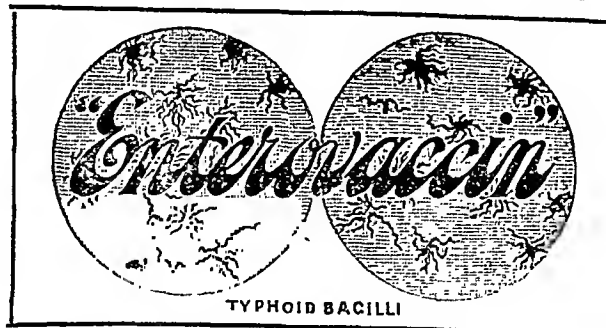
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## ANTITYPHOID

Inoculation by the gastro-intestinal tract



The results of **4,000** applications of **Enterovaccin** carried out by approximately 200 Doctors are as follows:

1. **No one** who has been treated with **Enterovaccin** has been attacked by typhoid fever.
2. This method of immunisation is without risk.
3. There is no contra-indication.

Enterovaccin is put up in hermetically sealed tins containing 28 spherules, sufficient for a complete treatment (one week). Each spherule contains per milligramme: 300 millions Eberth bacilli. 180 millions coli bacilli. 120 millions paratyphoid bacilli.

# IODEOL

Perfectly tolerated. Never causes Iodism.

Each capsule contains 4 grains of Colloidal Iodine in the most minute form of subdivision known.

It is administered by  
**INTRAMUSCULAR  
INJECTION**

for  
**Pneumococcal Disease**  
—Simple and Infective  
and  
**Broncho-Pneumonia.**

**Bronchitis.**  
**Pulmonary Congestion.**  
**TUBERCULOSIS, &c.**

**By the Mouth (Capsules):**

**Syphilis**, or wherever Iodides are indicated. Iodeol is ten times more active and does not cause Iodism.

**Externally (Liquid):**

Contains 50 per cent. Colloidal Iodine (must not be used for injection), ten times more active than painting with Iodine tincture—does not produce erythema or irritation. Absorption is extremely rapid.

**For Gynæcology (Ovules)**

These are introduced into the vagina, slowly discharge the iodine which penetrates deeply into the vaginal mucous membrane, giving rapid relief from congestion and pain.

Destructive to the micro-organisms.

## Indian Medical Gazette.

APRIL.

### THE BRITISH MEDICAL ASSOCIATION AND THE I. M. S.

IN the *British Medical Journal* (January 12th, 1918), there appeared the following memorandum submitted to the Secretary of State for India. We reprint it in full, along with portion of the leading article in the same journal on the subject:—

The Indian Medical Service, and the two Government medical departments in India, which are rather unhappily named subordinate, have suffered many things at the hands of the Indian bureaucracy. We propose now only to deal with the premier service, reserving what we have to say of the two departments for another occasion. The Indian Medical Service has a splendid record in clinical medicine and surgery, and in research, but it has fallen on such evil times that its sincerest friends are tempted to despair of it. Before Mr. Montagu started for India, he had been asked to receive a deputation to speak on behalf of the British Medical Association. There seems to have been some delay in bringing the request to his notice, and there was then no time for him to arrange the interview before he started. It has been considered advisable to send to him a memorandum, which is published in the Supplement this week on certain defects in the constitution of the Indian Medical Service, in anticipation of the interview which is to take place on his return to this country. The memorandum is not intended to deal with every detail, which must be adjusted by the Secretary of State and the Government of India if the Indian Medical Service is to be put on a satisfactory footing to enable it to do the best possible for the peoples of India, but it is believed to touch all these matters of principle by which details must be determined. The preamble sets out some truisms which it would seem are not understood by the secretariats at home or in India. The first three sections of the body of the memorandum are concerned with the position the advisers of the Secretary of State, of the Government of India, and of the Provincial Governments on medical and hygienic research and administration should hold, in order to ensure that expert advice shall always be available to the Governments in framing a sound health policy and in carrying it out in practice.

The remainder of the memorandum deals broadly with education and recruitment and with emoluments. If Great Britain is to provide an Indian Medical Service at all, it must attract the best. Less now than ever does India want the second-rate. The attraction by which the Indian Medical Service drew the right sort of young medical men was that it offered a career where the recompense for the hard work which must go to the

acquisition of skill would be found in the immense opportunities for the exercise of that skill, in the respect of the peoples benefited by it, in the recognition of the value of such work by the Government, and, finally, in the winning of the pecuniary reward which justly attends the successful practice of a learned profession. The glory of the Indian Medical Service has been the number of men it has produced, eminent in clinical medicine and surgery, including the various specialities, particularly, perhaps, ophthalmology, and in scientific research. A wise Government would do everything possible to foster their succession. That the contrary policy is being pursued by the ruling class in India is to be attributed to want of imagination due to the causes indicated at the beginning of this article, and in part, it is to be feared, to hierarchical exclusiveness and an unworthy jealousy. We trust to Mr. Montagu to put the matter right.

### INDIAN MEDICAL SERVICE: MEMORANDUM ON ITS PRESENT POSITION AND THE REFORMS NECESSARY.

*Submitted by the British Medical Association to the  
Secretary of State.*

The following memorandum has been presented by the British Medical Association to the Secretary of State for India. It will be remembered that in October 1917 the Association asked the Secretary of State to receive a deputation, to lay before him the causes of the present unsatisfactory position of the service, and of its consequent unpopularity in the schools. Mr. Montagu was unable to receive the deputation before his departure for India, but promised to receive it shortly after his return. Meanwhile it was thought well that this memorandum, containing a general statement of the most important points demanding the attention of the India Office in this country, and of the Government of India, should be submitted in anticipation of the deputation. It is here published for information.

### MEMORANDUM ON THE INDIAN MEDICAL SERVICE. *Preamble.*

The British Medical Association submits the following observations in the hope that they may assist the Secretary of State in settling the policy to be pursued with regard to the future of the Indian Medical Service.

The Association is not actuated by selfish or class motives. The officers of the Indian Medical Service constitute less than 2 per cent. of the total number of medical practitioners on the *Medical Register*, issued by the General Medical Council under the authority of the Privy Council; and the abolition of the Indian Medical Service would not appreciably affect the prospects of the medical profession in the British Empire, or of the medical schools and universities.

The Association assumes that the maintenance of an efficient Indian Medical Service is essential to the interests of the peoples of India, and that the duty of ensuring an efficient service appertains to the Secretary of State and the Government of India.

The Association is interested in the matter in so far as, for the honour of the profession it represents, it is anxious that the Secretary of State and the Government of India should not fail to obtain an efficient service owing to lack of information the Association may be able to supply.

The Association is concerned that the Government of India should not, through any want of appreciation of social and economic conditions as they affect the medical profession, or through a want of acquaintance with conditions governing the progress of medicine, surgery, pathology, and hygiene, pursue a policy which must in the near future deprive India of the benefits which a highly efficient and skilful medical service has had the privilege of rendering in the past.

The Association is aware that the officers of the Indian Medical Service are extremely discontented, and that they deeply resent the treatment to which they have been subjected by the Government of India and also, and more especially, by Local Governments. It is confident that the knowledge of this discontent and resentment has deterred, and must in the future deter young men from entering the service, and the authorities of medical schools from advising them to do so.

The Association begs to inform the Secretary of State that, in order to ensure to India an efficient and contented Medical Service, certain reforms are necessary, certain defects must be remedied, and certain general conditions be fulfilled as follows :—

#### INDIA OFFICE.

##### *Defects.*

There is need of a fuller recognition by the Secretary of State and the Government of India of the obligation on all governments to-day to apply the best modern means for the treatment of diseases and for the investigation of their causes with the view to prevention. To this end the Secretary of State, the Governor-General, and the Governors of Provinces need direct and continuous skilled advice on medical and sanitary problems, especially as to the enquiries and researches required for their solution, and as to the application of the results of such enquiries and researches by administrative action. The adviser should in each case be in a position to take a direct part in discussions preceding the decisions of the executive authority.

##### *Remedies.*

The Secretary of State has already taken a step towards remedying this defect in the case of the India Office at home. By the Order in Council of June 20th, 1916, the Secretary of State for India provided that the President of the Medical Board at the India Office shall also be the Medical Adviser to the Secretary of State for India. All reports and communications regarding medical and sanitary matters, and the organisation, personnel, recruitment, and appointment of officers in the Indian Medical Service, and of persons to the nursing and sanitary services, are referred to him for his advice, acting in his capacity of Medical Adviser to the Secretary of State. He supervises the recruitment

of the Indian Medical Service, and for this purpose is authorised to visit centres of medical teaching, in order to bring to the notice of the Secretary of State all questions in connection with recruitment. This officer should be relieved of the duties pertaining to the Presidency of the Medical Board, India Office. He should be the head of a distinct department of the India Office, to which all proposals affecting medical and sanitary matters should be referred for advice, and no order, minute, or other document relating directly or indirectly to any medical or sanitary matter should be issued by the India Office until his observations thereon have been considered by the Secretary of State, to whom he should have direct access.

#### GOVERNMENT OF INDIA.

##### *Defects.*

There are ten Secretaries to the Government of India in various departments, but no Secretary to the Government in the Medical and Sanitary Department. The Director-General, Indian Medical Service, is not a Secretary to the Government of India, and hence his recommendations and the reasons on which they are based reach the Executive, that is to say, the Governor-General and his Council, at second hand.

##### *Remedies.*

The Director-General of the Indian Medical Service should be a Secretary to the Government of India in the Medical and Sanitary Department, and the Secretary of the Director-General should be an Under-Secretary to the Government of India in that Department.

#### PROVINCIAL GOVERNMENTS.

##### *Defects.*

A Provincial Government has no Medical Secretary. The Surgeon-General of a Province is not a Secretary to Government, so that his recommendations and the reasons on which they are based reach the Executive of the Province at second hand (if at all).

##### *Remedies.*

In each Province the Surgeon-General should be a Secretary to Government in the Medical and Sanitary Department, and his Personal Assistant should be an Under-Secretary to Government in that Department.

#### EDUCATION AND RECRUITMENT.

##### *Defects.*

1. At present permanent commissions in the Indian Medical Service are being granted without examination, and a large number of temporary commissions are being issued.

2. Not only the competitive examination, but also the training for it, should be as practical as possible. Candidates from India are not required to undergo any period of training in British medical schools, and in consequence their acquaintance with certain subjects, specially the diseases of women and children, may be insufficient.

3. Ordinary leave had before the war become difficult to obtain at the time it was due, and was often postponed for long periods. The same was true of Study leave.



4. The Government of India does not afford sufficient incentives to officers, I. M. S., to devote themselves to scientific investigation of the causes and the prevention of disease, which it should be its special anxiety to encourage. It does not afford sufficient facilities, though the work of the Indian Research Fund has to some extent removed this reproach, and it does not afford them sufficient recognition and distinction, nor provide them adequate emoluments.

#### *Remedies.*

1. The practice of giving permanent commissions only on the result of open competitive examination should be resumed as soon as war conditions permit. The number of permanent commissions given by selection should be kept within the narrowest possible limits. It should be made plain that the grant of a temporary commission, Indian Medical Service, does not afford any presumption that the recipient will eventually be granted a permanent commission, except on the ground of professional knowledge and ability.

2. Successful candidates for the Indian Medical Service should be encouraged to hold resident hospital appointments, being seconded for this purpose.

Candidates from India should be required to undergo a period of training in British medical schools, especially in the diseases of women and children, and should, if necessary, be given special facilities for this purpose.

3. Leave should be granted when due, and the cadre should be increased so as to permit reserves for leave, deputation, and training. The regular grant of Study leave to junior officers to attend courses of instruction in medical schools, hospitals, and laboratories, in order to make themselves practically acquainted with the advance of scientific methods, is essential to the efficiency of the service, and provision should be made for them when fixing the establishment of medical officers.

Opportunities should be afforded to officers during the early part of their service to attend the practice of hospitals in the Presidency and other large towns.

4. The Government of India should regard it as one of its first duties to encourage scientific investigation by officers, I. M. S., and should take care that such work received conspicuous marks of its approval and appreciation both by the granting of suitable promotion and adequate remuneration, and in the bestowal of honours.

#### *PAY AND EMOLUMENTS.*

##### *Defects.*

The prospects for a young man entering the Indian Medical Service have ceased to be attractive, owing to,—

1. The low scale of pay and the lack of opportunities open to members of the Indian Medical Service of attaining to offices carrying large emoluments. The pay of the Director-General, Indian Medical Service, the most highly paid appointment open to the Indian Medical Service, is only 3,000 rupees, whilst that of the Secretaries to the Government of India is 4,000 (as a rule).

2. The diminution of the emoluments to be obtained from private practice. This is due in large part to the action of Government.

3. The decline in the value of money and the increased cost of living.

4. The serious expenses much exceeding the present inadequate allowance, attendant on frequent transfers from one post to another.

#### *Remedies.*

1. There should be a substantial increase in the scale of pay throughout the service; the emoluments of the highest posts, the possibility of attaining to which may induce officers not to retire, should be revised, so that they shall better correspond to the salaries paid to the occupants of posts involving similar grave responsibilities.

2. The curtailment of the right to receive fees from private patients is (a) impolitic, since that right remains one of the chief attractions of the service to men who have a prospect of a career in Europe, and an incentive to officers of the service in civil employ to maintain and increase their knowledge and skill. It is also (b) contrary to the plain terms of the conditions under which candidates seek admission to the service.

Any rule or order curtailing, whether directly or indirectly, the right to receive fees from private patients should be at once withdrawn. The Association desires a definite assurance from the Secretary of State for India that the officers of the Indian Medical Service retain the right to private practice save in the case of certain specified appointments.

3. The decline in the value of money and the increased cost of living should, pending the revision of the scale of pay recommended, be met by a substantial allowance.

4. The frequency of transfers should be reduced as far as possible; an officer transferred should receive an adequate allowance for travelling.

## **Current Topics.**

#### THE MADRAS MEDICAL REGISTER.

WE have received a copy of the Madras Medical Register for 1917, published pursuant to the Madras Act IV of 1917. It begins by publishing a WARNING NOTICE which it is doubtful wisdom to bind themselves by. This list contains the names of 75 medical men registered under the British Medical Act and also under the Madras Act; and of 345 men who are graduates in medicine of Madras University and registered under the Madras Act, and of 1,132 men who come under the heading of "All Other Medical Practitioners" registered under the Madras Act, the great majority of whom are "Licensed Medical Practitioners" of the Madras College—or the Medical Schools at Rayapuram and Vizagapatam, or with similar qualifications from Poona, Agra, Nellore, Cuttack, etc.

In this list we notice the names of several medical men with medical degrees from the United States of America and Canada, etc., etc., e.g.,

University of Illinois, Cornell, Toronto, California, Pennsylvania, Hopkins' University, and even Zurich and Copenhagen.

The WARNING NOTICE mentioned above is as follows:—

#### WARNING NOTICE.

"The following 'Warning Notice' which appears in the British Medical Register is reproduced for the information of medical practitioners registered in Madras, as the Madras Medical Council have resolved that 'the resolutions and decisions of the General Medical Council of the United Kingdom upon forms of professional misconduct should be adopted by the Madras Medical Council subject to the laws in force in India':—

The General Medical Council desire to bring to the notice of registered medical and dental practitioners the following statement, which summarizes the Resolutions and decisions of the Council upon forms of professional misconduct which have from time to time been brought before the Council in the exercise of their disciplinary jurisdiction over the members of the medical and dental professions.

This jurisdiction is conferred upon the Council by the 29th section of the Medical Act, 1858, which is as follows:—

'If any registered medical practitioner shall be convicted in England or Ireland of any felony or misdemeanour, or in Scotland of any crime or offence, or shall after due inquiry be judged by the General Council to have been guilty of infamous conduct in any professional respect, the General Council may, if they see fit, direct the Registrar to erase the name of such medical practitioner from the Register.' and by the 13th section of the Dentists Act, 1878, as follows:—

'Where a person registered in the Dentists Register has, either before or after the passing of this Act, and either before or after he is so registered, been convicted either in Her Majesty's dominions or elsewhere of an offence which, if committed in England, would be a felony or misdemeanour, or been guilty of any infamous or disgraceful conduct in a professional respect, that person shall be liable to have his name erased from the Register.

The General Council may, and upon the application of any of the medical authorities shall, cause inquiry to be made into the case of a person alleged to be liable to have his name erased under this section, and, on proof of such conviction or of such infamous or disgraceful conduct, shall cause the name of such person to be erased from the Register:

'Provided that the name of a person shall not be erased under this section on account of his adopting or refraining from adopting the practice of any particular theory of dentistry or dental surgery, nor on account of a conviction for a political offence out of Her Majesty's dominions, nor on account of a conviction for an offence which, though within the provisions of this section, does not, either from the trivial nature of the offence or from the circumstances under which it was committed, disqualify a person for practising dentistry.

'Any name erased from the Register in pursuance of this section shall also be erased from the list of licentiates in dental surgery or dentistry of the medical authority of which such person is a licentiate.'

It must be clearly understood that the instances of professional misconduct which are given below do not constitute, and are not intended to constitute, a complete list of the offences which may be punished by erasure from the Register: and that by issuing this

notice the Council are in no way precluded from considering and dealing with any form of professional misconduct (as, for example, immorality involving abuse of professional relationship) which may be brought before them, although it may not appear to come within the scope or precise wording of any of the categories herein set forth. Circumstances may and do arise from time to time in relation to which there may occur questions of professional conduct which do not come within any of these categories. In such instances, as in all others, the Council have to consider and decide upon the facts brought before them.

#### 1. CERTIFICATES, NOTIFICATIONS, REPORTS, ETC.

Registered practitioners are in certain cases bound by law to give, or may be from time to time called upon or requested to give, certificates, notifications, reports and other documents of a kindred character, signed by them in their professional capacity, for subsequent use either in Courts of Justice or for administrative purposes.

Such documents include, among others, Certificates, Notifications, Reports, etc.

(a) Under the Statutes relating to births, deaths, or disposal of the dead;

(b) Under the Acts relating to Lunacy and Mental Deficiency and the Rules made thereunder;

(c) Under the Vaccination Acts and the Local Government Board Orders made thereunder;

(d) Under the Factory Acts and the Home Office Regulations made thereunder;

(e) Under the Education Acts;

(f) Under the Public Health Acts and the Local Government Board Orders made thereunder;

(g) Under the Workmen's Compensation Acts;

(h) Under the Acts and the Local Government Board Orders relating to the notification of infectious diseases;

(i) Under the National Insurance Acts and the Regulations made thereunder;

(j) Under the Old Age Pensions Acts and the Treasury Regulations made thereunder;

(k) Under the Merchant Shipping Acts;

(l) In connexion with sick benefit, insurance and friendly societies;

(m) For procuring the issue of Foreign Office passports;

(n) For excusing attendance in Courts of Justice, in the public services, in public offices, or in ordinary employment;

(o) In connexion with naval and military matters.

Any registered practitioner who shall be shown to have signed or given under his name and authority any such certificate, notification, report, or document of a kindred character, which is untrue, misleading, or improper, whether relating to the several matters above specified or otherwise, is liable to have his name erased from the Register.

#### 2. UNQUALIFIED ASSISTANTS AND COVERING.

The employment by any registered practitioner in connexion with his professional practice of an assistant who is not duly qualified or registered, and the permitting of such unqualified person to attend, treat, or perform operations upon patients in respect of matters requiring professional discretion or skill, is in the opinion of the Council in its nature fraudulent and dangerous to the public health; and any registered practitioner who shall be shown to have so employed an unqualified assistant is liable to have his name erased from the Register.

Any registered practitioner who by his presence, countenance, advice, assistance, or co-operation, knowingly enables an unqualified or unregistered person, whether described as an assistant or otherwise, to

attend, treat, or perform any operation upon a patient in respect of any matter requiring professional discretion or skill, to issue or procure the issue of any certificate, notification, report, or other document of a kindred character (as more particularly specified in Division 1 hereof), or otherwise to engage in professional practice as if the said person were duly qualified and registered, is liable on proof of the facts to have his name erased from the Register.

The foregoing do not apply so as to restrict the proper training and instruction of *bonâ fide* students, or the legitimate employment of dressers, midwives, dispensers, surgery attendants, and skilled mechanics, under the immediate personal supervision of a registered practitioner.

### 3. SALE OF POISONS.

The employment, for his own profit and under cover of his own qualifications, by any registered practitioner who keeps a medical hall, open shop, or other place in which scheduled poisons or preparations containing scheduled poisons are sold to the public, of assistants who are left in charge but are not legally qualified to sell scheduled poisons to the public, is in the opinion of the Council a practice professionally discreditable and fraught with danger to the public, and any registered practitioner who is proved to have so offended will be liable to have his name erased from the Register.

### 4. ASSOCIATION WITH UNQUALIFIED PERSONS.

Any registered practitioner who, either by administering anæsthetics or otherwise, assists an unqualified person to attend, treat, or perform an operation upon any other person, in respect of matters requiring professional discretion or skill, will be liable on proof of the facts to have his name erased from the Register.

### 5. ADVERTISING AND CANVASSING.

The practices of (a) advertising by a registered medical practitioner with a view to his own gain, particularly if depreciatory of other practitioners, or of sanctioning such advertising, of (b) employing or sanctioning the employment of agents or canvassers for the purpose of procuring patients, and of (c) associating with or accepting employment under any Association which practises canvassing or advertising for the purpose of procuring patients, are in the opinion of the Council contrary to the public interest and discreditable to the profession of medicine, and any registered medical practitioner resorting to any of such practices renders himself liable on proof of the facts to have his name erased from the Medical Register."

### A GENERAL HOSPITAL FOR VENEREAL DISEASES.

THE following note is taken from a report by a distinguished American Surgeon (J. A. M. A., 1st December, 1917):—

British General Hospital No. 39 is a large institution of over 3,000 beds devoted entirely to the treatment of syphilis, gonorrhœa and chancroid. Four hundred of these beds are for officers. This is one of four similar hospitals conducted by the Royal Army Medical Corps for the treatment of these diseases. It is situated in the suburbs of ——— amid beautiful surroundings. It consists of huts, bungalows and tentage, the streets are well paved and perfectly drained, rows of shrubs and flowering plants line these streets, and has everything conducive to the comfort of the inmates. A well equipped operating room with special wards for surgical patient is one of the many good features

of the institution. The salvarsan room contains six tables with arm rests, irrigator stands, etc., and the intravenous treatment is frequently given to six patients at the same time. The intramuscular injection of neosalvarsan is used in a great many more cases than the intravenous—of old salvarsan—and with most excellent results.

The number of syphilis patients treated in this hospital since January 1st, 1915, was 11,500. To these patients were administered over 89,000 injections of salvarsan and neosalvarsan. The number of cases of dermatitis and jaundice developing was only 152, and the number of deaths occurring in this whole series was either ten or eleven.

As a result of the treatment in this hospital, the number of troops returned to the front effective for duty was over 11,000; while the number invalided to England in the last year was only seventy, which is but a fraction of the number heretofore sent home.

The French and English preparations similar to neosalvarsan and old salvarsan have proved fully as efficacious, and the standard treatment for syphilis in this hospital consists in the combination of the intramuscular injection of a suspension of metallic mercury in sterile oil and water in conjunction with the intramuscular injection of neosalvarsan, as well as the intravenous use of old salvarsan.

The Wassermann test is used in all cases before the men return to the front; but patients symptomatically cured even though exhibiting a positive Wassermann reaction, are nevertheless returned to the front because they are again effective for the full military duty.

The proportion of cases of syphilis to gonorrhœa is 1 : 3. Gonorrhœa here as elsewhere has proved more resistant to treatment than syphilis. The recent cases are treated with a 1 : 4,000 solution of potassium permanganate, used in the ordinary way as urethral irrigations. The cases of long standing are being treated with gonococcus vaccine, which is made in the hospital laboratory, and also by means of urethral bougies impregnated with any one of the various salts commonly used for the purpose.

On inquiry as to why venereal prophylaxis was not carried out in the British Army as it is in the American, I was informed that public sentiment in Great Britain had not as yet been educated up to the same point as in America, and that the frank discussion of these matters was still more or less taboo. One of the medical officers in charge made the statement that he feared that a soldier contracting a venereal disease and not reporting for prophylactic treatment, as required in our army, would by endeavouring to conceal his condition so neglect himself as to become a more difficult case when concealment was finally no longer possible.

The other three hospitals devoted entirely to this purpose and conducted by the British Army are just as busy as No. 39, so that the enormous number of non-effectives caused by prevalence of venereal disease can be easily demonstrated.

As the startling prevalence of venereal diseases in France has been demonstrated by the experience of the armies stationed here, it is hoped that in spite of our excellent measures of prophylaxis the American expeditionary force will have sufficient hospitals in readiness for the treatment of such of our forces as become infected in spite of all our preventive measures.

### INOCULATION AGAINST PNEUMONIA.

DR. F. S. LISTER has issued a valuable report on the value of prophylactic inoculations against pneumococcal infections and more particularly against Lobar Pneumonia among the native labourers in certain mines in the Transvaal and

at Kimberley. We quote his conclusions in his own words:—

(1) That from 63 to 77 per cent. of all cases of Lobar Pneumonia occurring under normal conditions in Native mine labourers in the Transvaal are caused by the Pneumococcus of one or other of the groups "A," "B" or "C."

(2) That Native mine labourers, who have been suitably inoculated with a vaccine comprising certain pneumococcal groups, are immune from Lobar Pneumonia due to such groups.

(3) That three subcutaneous inoculations of one c.c. of a vaccine containing representatives of groups "A," "B," and "C," and having a total content of seven thousand millions of cocci per c.c., have rendered a large Native mine population (Crown Mines) absolutely resistant to pneumonic infection by any of these groups during the observed experimental period of nine months.

(4) That during the experimental period, when Pneumonia due to groups "A," "B," and "C" had been completely abolished on the Crown Mines, these three groups were still prevalent (in about their normal ratio to all groups) amongst the pneumonic Natives on those mines where inoculation was not practised.

(5) That the unequivocal character of the results obtained on the Crown Mines suggests that triple inoculation with a three-group vaccine in doses of less than seven thousand millions of cocci would probably afford an efficient immunity against these three groups.

(6) That the Pneumococcus of groups "E," "H," "J," and "K" are probably of sufficient epidemiological importance to warrant their being included in future vaccine intended for Native mine labourers.

(7) That the alteration of relative group prevalence by means of specific group inoculation is a more critical test of the efficacy of Pneumonia prophylaxis than the simultaneous comparison of Pneumonia rates in inoculated and uninoculated (control) groups—when such comparison is based upon the erroneous assumption that all cases of the disease due to the Pneumococcus are bacteriologically indistinguishable.

#### NUISANCES DUE TO FLIES.

AN important monograph on the prevention of nuisances arising from flies and putrefaction appears in the October (1917) issue of the *Journal of Hygiene* (Vol. XVI, No. 2). It is written by Mr. F. W. Foreman, F.I.C., and Dr. G. S. Graham-Smith. It is a very complete account of their investigations and we cannot do better than let the authors tell their own tale by quoting their summaries and conclusions in their own words:—

#### FLY REPELLENTS.

"Throughout all our experiments, some of which extended over long periods, we compared as well as we could the numbers of flies approaching, alighting on and walking over treated carcasses and untreated controls. It is impossible to record these observations in precise terms and we can only state that some of the coal tar oils exert a very marked and prolonged repellent action, the period apparently depending on the rate of evaporation. We attempted to increase this action by varying the proportion of the constituents and by adding to creosote oil small quantities of reagents, which possess well marked repellent powers and are soluble in creosote oil, such as aniline, bone oil, pyridine and various other bases. Of these the most satisfactory appear to us to be the bases derived from 'light oil'

which add very distinctly to the repelling and other properties of creosote oil without appreciably affecting its flash point or pleasant smell. In the treatment of faecal material and in deterring flies from entering habitations and approaching food, it is desirable that the greatest possible deterrent effect should be exercised.

For general use as an inhibitor of putrefaction, deodorant, repellent of flies, and destroyer of maggots we recommend the addition to creosote oil, of the type we have previously described (p. 123), of sufficient bases derived from 'light oil' to make the proportion of phenolic bodies to bases two to one. This mixture has been called 'Solution C.'

If a means could be devised for preventing biting and other flies from settling on the exposed parts of the body, such as hands, face and neck, it would add immensely to health and comfort in tropical and subtropical countries. For this purpose an accurate knowledge of the relative repellent powers of various reagents, alone and in solution, is necessary. In the study of the relative powers of disinfectants descriptive methods failed to give reliable means of comparison. The failure of descriptive methods was even more evident when attempting to determine the relative powers of repellents. We have devised an apparatus with which we hope to obtain results of sufficient accuracy to make a reliable comparison of repellents possible.

The repellent powers of a substance appear to depend upon its nature and rate of evaporation, the latter affecting the length of time the repellent remains operative. Some of the best repellents are poisonous, inflammable or very volatile. These properties may be submerged by dissolving suitable quantities in such fluids as creosote oil. By such a procedure the high flash point of creosote oil may not be appreciably affected. The evaporation of the added substance is so retarded that it remains operative for a considerable time. To prevent flies from alighting on the exposed skin repellents might be employed in two ways:—by application to (1) the clothing, and (2) the skin. Clearly for these purposes irritating, poisonous and inflammable reagents must be avoided.

#### CONCLUSIONS.

1. In summer time maggots play a very important part in the destruction of exposed carcasses.

2. Coal-tar oils, such as crude carbolic, 'middle' creosote and 'heavy' oils, when used at full strength, kill large maggots almost immediately. Of these the most suitable for general use is creosote oil. Anthracene oil is much less effective.

3. The most potent constituents are contained mainly in the fractions which distil over below 240°C.

4. Each group of constituents of creosote oil possesses some degree of toxicity to maggots even when the exposure is momentary. The phenolic bodies in the absence of water are extremely toxic to maggots, which immediately become contracted, hard and tense, and within 15 minutes assume a deep red colour. The bases are also toxic, but the maggots remain white, and become extended and flaccid. The higher boiling fractions of the hydrocarbons are decidedly more toxic than these of lower boiling point.

5. Momentary immersions in dilutions of highly toxic constituents in water or inert fluids produce little effect on maggots to resist the toxic action of phenolic bodies to a large extent. By more prolonged treatment, however, the maggots may be killed, if dilution is not carried too far.

6. Maggots can survive 15 minutes' immersion in emulsions containing 5 per cent. phenolic bodies and reach maturity. They can feed on meat soaked in such emulsions without ill effect.



7. Maggots present in carcasses are killed by suitable treatment with creosote oil.

8. Even in warm and showery weather, particularly favourable to putrefactive changes at the height of the fly season, the bodies of small animals can be well preserved for several weeks by efficient surface treatment with coal-tar oils, especially creosote oil.

9. To obtain such results the surface treatment must be thorough, for eggs may be deposited on untreated areas and make their way into the carcase from these areas.

10. Open carcasses can be similarly preserved, if the exposed surfaces are treated.

11. This treatment protects the bodies from the influence of rain and soil water.

12. Experiments on the bodies of goats show that large carcasses can be preserved in the same way as small ones.

13. The combined effect of surface treatment with injection preserves the body for many months.

14. The removal of the abdominal organs is disadvantageous for intact carcasses are well preserved by surface treatment, and the process of removal permits of the introduction of putrefactive organisms into the tissues.

15. Surface treatment with watery emulsions, such as 'Solution B' delays putrefaction to a slight extent, but causes the destruction of innumerable eggs and small maggots. Sooner or later rain leches away the potent constituents and the carcase, left without protection, becomes available as food for maggots.

16. On the other hand treatment with creosote oil repels flies almost completely for a week or two, and to a less extent for a long period. After two or three weeks eggs are deposited. A large proportion of these die and great numbers of the maggots which emerge from them, also die. In fact in well treated carcasses it is doubtful if any maggots reach maturity. Hence in their different ways carcasses treated with such fluids as 'Solution B' or creosote oil act as traps for destroying fly eggs and maggots.

17. At any stage of decomposition maggots may be destroyed, smell eliminated, and the process arrested by suitable treatment with creosote oil.

18. Several reagents, possessing fly repellent properties, can be dissolved in creosote oil, in order to increase its efficiency in this respect. Of these the most satisfactory are the bases derived from "light oils." These increase the repelling and other properties of creosote oil without appreciably affecting its flash point or smell.

19. For general use as an inhibitor or putrefaction, deodorant repellent of flies and destroyer of maggots we recommend the addition to creosote oil of the type described of sufficient bases from 'light oil' to make the proportion of phenolic bodies to bases two to one.

20. The study of fly repellents by methods sufficiently accurate to make reliable comparisons possible might suggest means for preventing flies from alighting on exposed surfaces of living persons.

#### GENERAL SUMMARY.

1. Flies may be killed either by poisons (a) absorbed from the alimentary tract, or (b) acting through the respiratory system. They are very resistant to many alimentary poisons which possess considerable toxicity to animals, but are more susceptible to respiratory poisons.

2. As very little difference could be made to the general fly population by killing adults alone, we have not persisted with experiments designed for this purpose. Aniline is the most suitable of the reagents, not dangerous to man, used in the way suggested, which we have tested.

3. Flies are most easily and effectually destroyed by attacking them in their immature stages as eggs or larvæ.

4. The eggs of species likely to be dangerous to man by conveying infected material to his food are laid on (a) exposed animal matter, (b) manure, and (c) refuse.

The eggs and maggots in these situations may be considered to represent large numbers of flies in traps.

5. For killing eggs or larvæ in their breeding grounds we have found coal-tar oils, especially creosote oil, to be the most satisfactory reagent. Aniline emulsions are useful, but have little effect on putrefactive processes and the nuisances due to them.

6. Flies may be repelled from substances which attract them such as decaying bodies, faecal material, etc., and kept out of habitations by means of the repellent constituents of coal-tar oils.

7. Flies sprayed with these oils are killed.

8. In carcasses true putrefaction or disintegration is preceded by (a) early gas formation, mainly due to the action of intestinal organisms on the carbohydrates of the intestinal contents and tissues, (b) exudation of fluid, probably due to the effects of cytolysis and enzyme action, and (c) green discoloration of the skin which appears to be connected with the effect of hydrogen sulphide or organic acids on the blood pigments. By suitable treatment the tissues may be rendered sterile, when neither gas nor green discoloration is produced though fluid exudes.

9. By true putrefaction in carcasses we mean the breakdown of the tissue constituents, accompanied by the elimination of foul-smelling products. The process is due to the activity of putrefactive bacteria assisted by the action of tissue enzymes. Gas production and exudation of fluid continue as true putrefaction proceeds, but in much smaller daily increments than in the preliminary stages.

10. Descriptive methods are lacking in precision and do not give definite information regarding the progress of putrefaction. The need arose therefore for a method by which the actual products of putrefaction could be estimated. The importance of the combined activity of autolytic enzymes and putrefactive organisms in the disintegration of a carcase was impressed upon us by noting the great rate of production of volatile bases in tryptic digests containing such bacteria.

The putrefactive powers of various species of bacteria can be measured definitely by incubating an amino acid mixture containing the organisms under standard conditions for a suitable time and determining the ratio of bases to amino acids.

We claim that by similar means the relative powers of different disinfectants to inhibit the action of putrefactive organisms on carcasses (kept under standard conditions, can be compared precisely using for analysis the fluids which exude or tissues from comparable situations.

The proteolytic as well as the diaminating enzymes of autolysis produce small amounts of ammonia. The results of their combined activity, in the absence of organisms, yield a low ratio of volatile bases to the substances which respond to the formyl titration. If putrefactive organisms do not develop in a treated carcase same low ratio is obtained. The ratio is correspondingly greater the more active the organisms.

Our method enables us to measure the progress of putrefaction under all conditions, provided the reagents used to inhibit putrefaction do not interfere in the estimations.

11. The stench arising during putrefaction are mostly derived from acid and basic products and from sulphur bodies. An ideal deodorant should be capable of fixing or absorbing all foul-smelling bodies.

12. We believe that putrefactive bacteria may gain entrance into the tissues through the skin.



13. The presence of water and a high temperature provide optimum conditions for the progress of putrefactive changes.

14. In the superficial treatment of intact or opened carcasses and other putrescible materials, reagents should be used which adhere to the greasy surfaces, form films, render the skin water-proof and kill the bacteria in it, thus checking putrefaction by preventing the access of water and putrefactive bacteria to the tissues. Further, the reagent should be capable of eliminating any stench which may arise, repelling flies, killing the eggs or larvae, resisting the action of water and remaining operative in all respects for a long period.

15. Watery emulsions of disinfectants are necessarily deficient in most of these properties. Undiluted oily reagents only possess them.

16. By superficial treatment combined with injection of certain reagents into the blood vessels exposed carcasses may be preserved for months.

17. The burial of carcasses does not prevent the development larvae present on them, or the subsequent emergence of the flies.

18. In our experience the reagent, which possesses the required properties to the greatest extent, and gives the most satisfactory results in practice, and is sufficiently cheap and easily obtained, for use on a large scale, is coal-tar, creosote oil of country make.

19. For general purposes especially when the repelling of flies is of importance, we recommend the use of coal-tar creosote of country make, containing a high percentage of phenolic bodies, to which sufficient bases, extracted from 'light oil' are added to make the proportion of bases to phenolic bodies approximately one to two."

#### THE I. M. S. BADGE.

IN our last issue (p. 109), we drew attention to the new I. M. S. badge to be worn in khaki service dress in lieu of the black tab or gorget so long in use. We are now able to give an illustration of the new badge, taken from a pair of gilt



badges kindly sent us by Mr. K. Mahmood Shah, military outfitter, Ludhiana, Punjab, from whom the badges are obtainable, prices, gilt, Rs. 8, and bronze, Rs. 6 per pair.

WE have to welcome a new Medical Journal, viz., the *Madras Medical Journal*, a "bi-monthly" journal dating from January 1918, though its first copy did not reach our table before the middle of February. It is published by Messrs. Hoe & Co., for the "Madras Medical Association" which we are informed is composed of "Members of the Madras Provincial Medical Service" and

it will take the place of the publication of the transactions of that Association.

The new journal begins well and has some excellent articles, e.g., on vaccine therapy by Dr. M. Kesava Poi, who is a convinced supporter of the method and neither a faddist nor an unbeliever. Dr. M. L. Kamath and B. S. Baliga in a short paper show the prevalence of intestinal worms at Calicut. Other good papers are by B. S. Row on pneumonia, and a note on "*Kadu Infection*" by Drs. Kamath and Baliga due to the prick of the spines of an edible fish giving rise to violent cellulitis.

As the oldest medical journal in India and now in our 53rd year of existence we offer a hearty welcome to the new Madras venture.

THE attention of our readers may usefully be called to the Nursing Home, Rookwood, Simla, under the auspices of the Lady Minto Indian Nursing Association.

The house is centrally situated with a good garden and spacious verandah.

Medical attendance is provided free for such as are entitled to it free in their own homes. Other patients can make arrangements with their own medical attendant.

Applications after 1st March to be made to Chief Lady Superintendent, Lady Minto's Nursing Association at Viceregal Lodge, Simla.

#### Reviews.

**A Preliminary Course of Surgery.**—By R. L. SPITTEL, F.R.C.S., Surgeon to the General Hospital, Colombo, Ceylon. 111 Illustrations, 1918. Butterworth & Co, Calcutta.

WE have read this book with pleasure. It is, as it aims to be, an introduction or preliminary course of surgery, and especially of surgical principles. After an introductory chapter the author goes on to treating bacteria, sterilization, inflammation etc., healing ulcers, gangrene, wounds, infective diseases, specific infections, etc., etc. The book is well illustrated, and made useful for students by the free use of various types in the printing. We have no doubt that the book will prove most useful to medical students, and might well be adopted as a text book for junior surgical students in medical schools. For such a book there must surely be a demand in the schools of India, Burma, and Ceylon, and we know of no volume so well adapted to the students in such schools as that of Mr. Spittel.

**Painless Childbirth.**—By C. WEBB-JOHNSON, CAPT. R.A.M.C (T.). Calcutta: Butterworth & Co., Hastings Street. Price Rs. 4.

OUR readers will remember that Capt. C. Webb-Johnson recently wrote in these columns

on the subject of painless childbirth. The subject is naturally one of great interest and importance, and it is well to have it thoroughly discussed.

The first and most important fact to remember is that the use of scopolamine demands and necessitates the most minute attention to detail on the part of the doctor in attendance. It means the induction of a state of semi-narcosis, during which the child is delivered, a non-natural state which demands the constant attendance of a doctor or of a specially trained nurse during the (it may be) long hours of labour. We confess that while we see much that is of great value and interest in the little book before us we are neither impressed or pleased with the somewhat sensational quotations which are freely interspersed, and many pages of fine writing might be profitably omitted, if the book is intended, as it seems, to be a guide to the medical practitioner. The allusion to the Crippen and the Maybrick cases have nothing to do with the subject and might easily have been avoided.

Portions of Chapter III on the drugs, used in inducing the so-called "Twilight Sleep," are useful, but if the book is intended for medical men many details about the physiological action and the tests for morphine and hyoscine might have been omitted. The chapter on the "history of twilight sleep" is useful and contains much information not easily available. The description of the Freiburg technique is good and detailed. In Chapter XI the author gives his own experience and describes a method "to save time and trouble and to obviate the constant attendance of the doctor or nurse": this is a very important matter and if it can be proved that this constant attendance is not necessary much will have been gained.

We will leave Captain Webb-Johnson to our readers. They should read his book and they must judge for themselves of the reliance to be placed on his advocacy. Such a book is certainly needed, for the literature on the subject is largely to be found in periodical literature, and therefore we can strongly commend the book. Medical men *must* understand the subject and be prepared to give a definite opinion on it when asked, and they will find much of value and interest in a convenient form in the little book before us.

**The Theory and Practice of Massage.**—By BEATRICE M. GOODALL COPESTAKE. H. K. Lewis & Co., Ltd., 1917.

THE practice of Massage, along with all other methods of restoring usefulness to disabled and crippled limbs and joints, has of necessity come greatly to the front of late. The War has been prolific in the production of injuries of this class, and the cure or improvement of them is a

matter of national importance. Its value is enhanced by the fact that Massage can be, and as a rule is, practised by women.

Miss Goodall Copestake's book is for these reasons very welcome and provides a valuable guide for those taking up the subject.

The book is clearly written, the illustrations are good, and the printing and binding all that could be desired.

**Memoranda on Army General Hospital Administration**—By various Authors. Edited by P. MITCHELL.

THIS volume is mostly taken up with criticisms of procedures at present in force in general hospital administration. It endeavours to point out how these procedures could be improved upon, and the authors have many useful suggestions to make. The co-ordinating of the Civil and Military demands during a prolonged war, with a view to obtaining greater efficiency and economy, forms the subject of an interesting chapter. This brings into the foreground a problem that must seriously engage the heads of the Medical Department now that the war is nearing the close of its fourth year. The book is well printed and bound.

**The Venereal Disease Problem.**—By J. K. WATSON, M.D. Baillière, Tindall & Cox, 1917.

THIS small volume, 52 pages in all, is written by the author to provide information for nurses and midwives on a subject that is usually avoided in books written for members of these professions. It deals with soft and hard sores, secondary, tertiary and inherited syphilis, and gonorrhœa. It is clearly and simply written, and should prove of use to those for whom it is intended.

**The Baby's Food.**—By ISAAC A. ABT, M.D., Prof. of Diseases of Children, North-Western Medical School, Chicago. Publishers, W. B. Saunders Company. Price 6s.

THIS is a small book of 143 pages, consisting of recipes for the preparation of food for infants and children. There are also instructions about baths and packs, care of bottles, nipples, etc.

The physician is often asked by mothers and nurses for minute directions as to the preparation of the foods ordered, and is frequently puzzled to give a satisfactory reply. This book gives the necessary details, e. g., 8 pages are devoted to different beverages, 9 pages to broths and soups, and 19 pages to different milk preparations.

Invalid diet too often lacks variety, and any book is welcome which adds to that variety. As an example, 9 different "Junkets" are described. There are also diet lists for different ages.

The book can be recommended and will be found of great convenience in prescribing diets.

**Radiography and Radio-Therapeutics.**—By ROBERT KNOX, M.D. (Edin.). Part I, Radiography. Pages 382 with 78 Plates and 337 Illustrations in the text. Second Edition. Price 30s. net A. & C. BLACK, Ltd., London.

THE first part of this book deals with the sources of electrical energy, and then goes on to describe the apparatus used for the production of X-rays, with all the various accessories employed. A further section, useful at the present time, is on the use of the Rays in the field.

The following chapters are concerned with the production of the radiograph, its development, and so on. The localisation of foreign bodies in the tissues is fully described.

What may be considered the second portion of the book consists of the radiography of the normal bones and joints, and this is followed by the conditions found when they are diseased. The examination of the thoracic and abdominal viscera then follows.

The most striking feature of this work is the extremely practical way in which it is written, which makes it most useful not alone to the beginner, but also to one who is only moderately conversant with the subject. The description of the apparatus and technique is particularly clear and concise, many different forms being described.

The author is strongly in favour of close collaboration with either the physician or surgeon, and lays stress on the point that in difficult cases a knowledge of the clinical history of the patient may be most useful.

The illustrations are excellent, and the plan of presenting a picture of the print alongside the negative is useful. In fact there is only one minor point to comment adversely upon, and that is, when he advises against using bismuth subnitrate for the purpose of filling a sinus, it is not quite clear whether he means Beck's bismuth paste, which, properly used in the right class of case, is most useful.

The book can be thoroughly recommended, and the publishers have done their share of the work admirably.

## BOMBAY MEDICAL COUNCIL.

FEBRUARY SESSION 1918.

THE HON. SURGEON-GENERAL R. W. S. LYONS,  
M.D., I.M.S.,

*President in the Chair.*

1. *Read*—Letter dated Kolhapur, 21st August, 1917, from Sub-Assistant Surgeon Raghunath Vaman Bapat, stating that an Ayurvedic medical school has been started in Kolhapur; that the promoters of the same desire to impart elementary knowledge of western medicine to their students, and have asked men practising western medicine whether they would undertake to coach their students in

the elementary principles of anatomy, physiology, Medicine, etc.; and enquiring whether it would be legal on his part, in accordance with the Bombay Medical Act, if he either took their classes or co-operated with his brethren on the staff, imparting to the students the principles of western medicine.

*Resolved*—That the Bombay Medical Council does not consider the association of a registered practitioner with any institution adopting any particular theory of medicine or surgery illegal, provided such association does not include any act which would render a registered medical practitioner amenable to the discipline of the Council. In this connection Mr. Bapat's attention is drawn to the appended "Warning Notice."

2. It was resolved at the meeting of the Medical Council, held on the 3rd September, 1917—

"That Government be moved to amend the Bombay Medical Act so as to allow all practitioners registered in another province to be registered in Bombay free of charge, provided reciprocity is given in the matter by the other Councils; and that, before addressing Government, it be ascertained whether the other Medical Councils are prepared to accept the arrangement."

In pursuance of the above resolution, the other Medical Councils were consulted and their replies placed before the Bombay Medical Council. On a consideration of the replies received, the Council resolved—"That the Bombay Government be asked to refer the matter to the Government of India with a view to legislation, which will enable the different Medical Councils to act reciprocally with regard to registered practitioners, it being pointed out at the same time that the want of such legislation affects seriously military assistant surgeons and military sub-assistant surgeons."

3. The Council resumed the enquiry into the charge of infamous conduct in a professional respect within section 9 of the Bombay Medical Act, 1912, brought against Mr. Hormasji Manekji Masina, F.R.C.S. (Eng.), L.M. & S. (Bom.), a registered practitioner, he having caused, or knowingly and with his consent having permitted, to be published in the *Jame Jamshed* newspaper certain statements purporting to be in acknowledgment of donations to the "Dr. Masina Hospital Fund," in which statements laudatory references were made to him personally.

The Council after hearing Mr. B. J. Desai, Advocate, High Court, Bombay, who appeared on behalf of Mr. Masina, who was also present in person, passed the following resolution:—

"That the Medical Council having regard to the assurance given by Mr. Masina that he has requested the public press not to publish any donations containing any personal reference to

himself or laudatory notice regarding himself in any capacity whatever, and that in the event of any donations sent to him containing personal references to himself, he will cause the publication of the mere donations omitting all reference to himself, and that he will take all the means in his power to prevent the appearance of any public laudatory notice regarding himself, have resolved not to proceed further in this case."

4. The Council then proceeded to elect the six members of the Executive Committee for the year 1918. The voting resulted in the election of the following six gentlemen:—

Dr. Sorab Nariman.

Mr. A. G. Viegas.

Sir Temulji B. Nariman, *Kt.*

Col. W. E. Jennings, *I.M.S.*

Sir Balchandra Krishna, *Kt.*

Lieut.-Col. Thomas Jackson, *I.M.S.*

## ANNUAL REPORTS.

### MADRAS VACCINATION REPORT.

MAJOR W. A. JUSTICE, *I.M.S.*, submits the report from which we take the following extracts:—

(ii) *Vaccine*.—The experiment of storing vaccine lymph in the raw condition, and grinding and mixing it with lanoline as required for issue, was discontinued. The vaccine was prepared throughout the year on the old method, and the bulk of the lymph supplied was lanolinated vaccine. Glycerinated vaccine also was supplied to Madras and to Colombo for seed lymph.

Supplies to local bodies of lanolinated vaccine were made fortnightly as usual. In a few selected towns, however, tri-monthly supplies were ordered as an experimental measure, to see whether such frequent supplies would effect any improvement in the local success rates. The result of the experiment is under observation. Its extension to other tracts will depend upon whether reports are favourable or not.

The total average success rate of the year was 86·81 per cent. of cases vaccinated against 87·70 per cent. in 1915-16. The highest rate (90·03 per cent.) was recorded in October and the lowest (82·55 per cent.) in June. Judged with reference to districts, Kurnool (96·85 per cent.) takes the first place and Godavari (68·34 per cent.) the last. The success rate was also bad in several other districts; Coimbatore and Godavari are conspicuous in returning lowest success rates year after year. Chingleput, their companion in previous years, shows some improvement during the year under review. The local bodies of all these three districts are fully aware of the uniform backward condition of vaccination in their jurisdictions. The reports received from them on this feature, with reference to paragraph 5 of G. O. No. 1299 L., dated 22nd September 1916, were duly forwarded to Government. Proposals to improve the present conditions in their districts have been framed, and revised instructions issued defining clearly the period within which the vaccine despatched from the institute should be used by the vaccinators. The putting in operation of these remedial measures is now in the hands of the local bodies, and the necessity of seeing that the revised regulations are properly enforced should be impressed upon them.

As in the past year loud complaints were received from several districts regarding the poor quality of

lymph, but none of these could stand close scrutiny and most of them were based on some change in the colour of the vaccine paste, due entirely to the kind of lanoline now obtained from England, but which in no way affects the quality of the lymph. What is, however, of much more serious consequence, in my opinion, than the reduced percentage of success is the lowered quality of the results secured in successful cases within the last few years. I have over and over again drawn attention to this increasing defect in my inspection notes on vaccination in the districts, and there is little doubt whatever that the persistence of small-pox in many districts is much due to this. The main cause for such continuous fall in success rate appears to be the ignorance and inefficiency of the present class of ill-paid, uneducated, and unqualified vaccinators. In every district there is dearth of suitable hands for vaccinator's appointment, as no one can be tempted into an employment which carries no living wage, while the duties attendant upon it are particularly arduous. The remedy lies in giving effect to the long deferred schemes of improving the pay and prospects of the vaccination staff.

The Secretariat comment on the report contains the following:—

The general results of the year were unsatisfactory both in regard to the number of operations performed and in regard to the degree of success obtained. Inspecting officers lay the blame for this state of affairs mainly on the ignorance and unreliability of many of the men employed as vaccinators, and the Government have for some time recognized the necessity of attracting a better class of men. While the inspecting staff is paid by Government, the vaccinators are employed by local boards and municipal councils; the resources of most of these local bodies are limited, and the pay given by many of them to their vaccinators is so small that it attracts only men who can get no employment in any other capacity. The Government have sanctioned an improvement in the pay and prospects of the deputy inspectors of vaccination from April next, and have urged on local bodies the necessity for a similar improvement of the pay and prospects of vaccinators, accompanied by an insistence on higher qualifications and character in the persons selected. More than one district board has already propounded a scheme of reorganization, and all are, it is believed, aware of the deficiencies in the present arrangements for protection against small-pox and willing to effect the necessary reorganization.

### MADRAS TRIENNIAL HOSPITALS REPORT.

THIS report dated 19th July, 1917, only reached us in February, 1918. It is the last report written by Surgeon-General W. B. Bannerman, *C.S.I., M.D., I.M.S.*, and is exceptionally interesting. We cannot do better than quote freely from it:—

#### INADEQUACY OF MEDICAL RELIEF.

After pointing out the still inadequate provision for the medical needs of the 43 millions of the inhabitants of the Madras Presidency, Surgeon-General Bannerman goes on to say:—

A question closely related to the inadequacy of medical relief is this: the number of private medical practitioners who can supplement the work of public institutions is very small in this country as compared with the United Kingdom, where, according to the latest available figures, the number of registered medical practitioners

at the close of 1915 was 43,325 for a population of about 45 millions, while in the Madras Presidency, with a population of over 43 millions (or roughly speaking, about the same as that of the United Kingdom), there were only 1,354 at the close of 1916. According to the census of 1911, the number of medical practitioners of all descriptions was only 25,108; and this number includes all vaidyans, hakeems, veterinary surgeons, and that large class of blatant quacks whose dangerous practices are unfortunately still rampant all over the country. Even our very small number of registered medical practitioners is not distributed uniformly throughout the land, there being a concentration of them in and around our large towns and cities, while the supply in rural areas generally, and in the Agency tracts, Ceded Districts, etc., in particular, is quite inadequate. It is unfortunate that practice in rural areas has not yet become popular among the men who pass out every year from our medical schools and colleges; but there is unlimited scope for work in this direction, and money too for keen and capable men. In view of this scarcity great value is to be attached to the institution of itinerating dispensaries in rural areas, which take both doctor and drug to the very doors of the sick and the suffering. The founding and maintaining of large institutions is beyond the means of most local bodies, and Government does not demand it of them. But, with regard to the smaller hospitals and dispensaries, the case is wholly different. The founding and maintenance of such institutions is one of the primary duties of local bodies. It is also one of the most laudable objects, to which public funds and private charity may be applied. It is now recognized that to education—even secular education—trust funds of temples and other religious and charitable endowments may be legitimately applied."

#### EXTENSION OF MEDICAL EDUCATION.

Surgeon-General Bannerman wrote as follows:—

To meet the above noted demand for medical men to staff hospitals and dispensaries, steps have been taken by Government to admit more pupils to the Medical College, Madras. But it must be recognized that, if the needs of the country districts are to be adequately met, we must increase the number of medical men who will be content to live in the villages and small country towns. From experience it has been found that the elaborately trained and expensive university graduate will not settle down in the country and be content with the small fees he can expect from villagers and poor agriculturists. Bearing this in mind Government have resolved to do all they can to increase the number of medical men trained in the medical schools of the Presidency. These men, to whom Government have now accorded the title Licensed Medical Practitioner, are given a thorough training for four years in medicine, surgery and midwifery and all underlying scientific subjects. They are therefore fitted to perform all the duties of a medical man and many of them have risen to eminence in the profession. By these men all the smaller hospitals and dispensaries are staffed, and it is found that they are content to settle in small rural towns and villages. They form the backbone of the medical army in the country districts, and are the hope of the villager as regards medical aid. To increase the number of these men Government have sanctioned the increase in the number of pupils in the medical schools, and the increase of the latter from three to four. The syllabus of instruction has likewise been remodelled so as to bring it up to date in all respects."

#### MEDICAL INSPECTION OF SCHOOL CHILDREN.

He next pointed out the urgent need of medical inspection of school children, as the report of Lieutenant-Colonel Donovan, I.M.S., showed that "absenteeism is very common" and

"the cause is suspected to be tuberculosis," and moreover it will surprise many to learn that "the presence of *leprosy* among the children is "in as high a proportion as 5.9 per cent. of "children examined"—a truly remarkable pronouncement. Schemes for improving the nursing and the teaching of midwives are in existence, and the employment of health visitors is again urged.

**House-Surgeons and House-Physicians.**—It is now recognized that the period of five years, which is the minimum time required to obtain any British registrable medical qualification, is insufficient to enable the young practitioner to acquire the practical training, the power of observation, and the handicraftsmanship, which are necessary to enable the student to develop into the practical and self-reliant physician and surgeon. The overcrowding of the medical curriculum is now so great that few graduates in England attempt to begin practice without first holding a 'House-appointment' in a good hospital. It is chiefly with a view to give this much-needed practical teaching to our young graduates that the scheme of House-Surgeons and House-Physicians was instituted in the Presidency. It was also hoped that the scheme would lead to increased efficiency of the hospitals where these House-Surgeons and House-Physicians were employed, and that it would provide a valuable test of the character and general ability of aspirants to Government Medical Service. To some extent, all these objects have been already attained, although it is rather disappointing to note that there is an unfortunate tendency to attach more value to the gaining of '100 marks' in the subsequent entrance examination than to the improvement of professional knowledge, and to look upon the appointment more as a means to an end (to wit, Government service) than as a very desirable thing in itself. It is hoped that in time this tendency will disappear. There are at present 29 appointments for House-Surgeons and House-Physicians in the Presidency-State hospitals and in certain selected headquarter hospitals in the mufassal. It would be an advantage if the scheme could be extended to other important headquarter hospitals, so that every graduate passing out of the Medical College should be able to secure a post as House-Surgeon and House-Physician, but the present financial stringency precludes this being done.

The Superintendent, Government Ophthalmic Hospital, reports that *Scarlet R* has been very freely used and been found a most valuable drug in the treatment of many cases of late trachomatous conditions, especially in the slight ulceration and pannus, which sometimes persist after the conjunctival condition has become healthy; it has also been found effective in the treatment of "post-trachomatous Xerosis." He also reports favourably on the treatment of vesicular keratitis by picric acid, and of septic conditions of the conjunctiva, cornea, and iris by urotropine in 15-grain doses, every three hours, with concentrated saline, or solution of magnesium sulphate (20 to 35 grain to the ounce) as an useful adjuvant to stimulate the lymph secretions of the part.

The "continuous inhalation treatment" for *tuberculosis* is being tried at the wards of the First Physician, General Hospital, Madras, who reports that "when consistently carried out, it appears to yield, on the whole, better results than any other form of treatment." He also reports that quinodine was used instead of quinine in a number of cases of malaria, and was found to act as quickly and efficiently as quinine, although the dose never exceeded 8 grains per diem.

The First Surgeon, General Hospital, reports very favourably on the treatment of even inoperable cases of *infective granuloma* by intravenous injections of anti-monium tartrate; he adds: "If this treatment prove



to ensure permanent cure, it will be an incalculable blessing, especially to those unfortunate cases (most common among females) where the anal canal becomes infected, making life a misery. No other treatment up till now has been of any benefit to the latter cases."

**Tuberculosis.**—The number of admissions for tuberculosis was 18,171 during 1916, against 15,930 in 1915 and 15,999 in 1914. In recent years much attention has been paid to this subject; and the 15th of July, 1916, the day on which the "King Edward VII Memorial Institute for Tuberculosis" was opened to the public, will always be remembered as marking a new era in the campaign against this scourge in Madras. The statistics of the Presidency point towards an increase in the incidence of the disease and the Director of the Tuberculosis Institute in Madras infers from statistics collected by him that there is a "wide prevalence of tuberculosis in the City of Madras," especially among the students and clerks who form the large majority of cases treated at the Institute. It is quite true that there are differences of opinion on this point, and some would attribute the observed increase in incidence to better diagnosis and such other causes, rather than to an actual increase in the prevalence of tuberculosis. But there can be no manner of doubt that the modern economical, industrial, and sociological changes of India tend towards increased prevalence of this insidious disease; and the movement for establishing special institutions for the treatment of tubercular cases has not been started a moment too soon. Proposals are now under consideration for opening a tuberculosis ward at each headquarters hospital.

**Leprosy.**—The number of admissions for leprosy was 8,399 in 1916, against 7,667 in 1915 and 7,159 in 1914. These numbers represent of course only a small portion of our total leper population; the number of institutions for receiving lepers are few and consequently a considerable number are everywhere found to be at large as professional beggars, sweetmeat vendors, and so on. The danger of permitting this state of affairs to continue is obvious. Then again, there is the terrible fact revealed by Colonel Donovan's medical inspection of school children, that nearly 6 per cent. of the children inspected showed leproid patches. Everything points to the urgent need for bringing the Lepers' Act into force in the Presidency; but this cannot be done until the Leper Asylum at Chingleput is ready. Plans for this asylum have been sanctioned, and it is hoped that money may soon be found for the buildings. The new method of treatment introduced by Sir Leonard Rogers, I.M.S., is being tried at the Government Leper Hospital, Rayapuram, and the Superintendent reports that the results have so far been encouraging.

**Hook-worm.**—Some fairly accurate idea of the amount of hook-worm infection may be obtained from the reports of medical officers of jails, where the faeces of every prisoner are systematically examined for the ova of intestinal parasites. The percentages of hook-worm infection are as follows:—In the jails of Coimbatore and Rajamundry, 32 per cent.; Cannanore, 21 per cent.; Trichinopoly, 13 per cent.; Vellore, 8 per cent.; Salem, Berhampur, and the Penitentiary, Madras, less than 10 per cent.; and Bellary as low as 2 per cent. It is not easy to explain such wide differences; possibly they may serve to indicate roughly the prevalence of the disease in the several areas from which the prisoners of each jail are generally drawn; but it is also possible that differences in technique and the personal equation of the examiner may also be contributing factors in these wide differences. The Civil Surgeon, Coonoor, classifies the patients examined by him at Coonoor during the period of one month into (1) latrine users, who are town-dwellers, and (2) free defæcators, who form the rural population. The free defæcators are further subdivided into (a) close defæcators, being those who work and live on highly cultivated land and are in the habit of defæcating

on the land on which they work and often in close proximity to their dwelling lines, and (b) open defæcators, who are jungle-dwellers, living in open and largely uncultivated land and who defæcate in open waste land where no cultivation is being carried on. The result of his examination was practically negative in the case of the latrine users and open defæcators, whereas, even by the admittedly imperfect routine followed, as many as 77 per cent. of the close defæcators were found infected. From his observations, it is also seen that town-dwellers are generally free from infection by ankylostomiasis, being probably safeguarded by their habit of using latrines, while the cultivators are for the most part, and probably universally, infected. It is also probable that the more closely the land is cultivated and the more difficult it is for the cultivators to obtain waste land on which to defæcate, the more complete will be the infection of the people by hook-worms. It is reported from the Nellore district that among coolies employed in road-making and kept under strict supervision, 271 men and women were given thymol and 84 of them passed ankylostomes showing a percentage of infection of nearly 31. Among the prophylactic measures suggested is dipping the feet in tar—a somewhat unpleasant form of treatment—but it may not be objected to by our agricultural coolies, among some of whom at least, the habit seems to be already prevalent, as for example, in the districts of Tanjore and Madura, where they are known to cover the soles of their feet with tar before undertaking the transplanting of paddy; and the general impression seems to be that this will help them to avoid what is known locally as "*chettupunnu*," "the ground itch" or "mud itch," said to be produced by working in the miry soil of the fields. This "ground itch" is presumably the first obvious result of the entrance of the embryos of hook-worms into the body. From the reports obtained, it is probable that the disease is present in many, and most probably in all the districts of this Presidency, and that the percentage of people harbouring hook-worms is very high indeed. Estate coolies, sweepers, bricklayers, gardeners, and farmers are mostly affected with this disease. In the Central Jail, Rajamundry, 49 per cent. of the infected persons are agricultural coolies and 23 per cent. cultivators. No caste or religion appears to be exempt; and from a labour and economic standpoint the need for further research is obvious. We need to have an organized campaign against the spread of this disease; and this cannot be arranged until experimental investigation has shown how far the population is affected, and a study made of the local conditions favouring the liability to attack. This is now being carried out by Dr. Mhaskar at Negapatam, Trichinopoly, and Dindignl, under the direction of the Indian Research Fund Association, and results have been already secured of great interest and importance (*vide* an article by Dr. Mhaskar on "The Prevalence of Ankylostomiasis in the Madras Presidency" in the *Indian Journal of Medical Research* for April 1917).

#### A TROPICAL SCHOOL FOR MADRAS AND RESEARCH.

The city of Madras would be an ideal place for the location of a school of tropical medicine. It is second to none in India in the matter of its medical institutions and the richness and variety of clinical material available relating to diseases of the tropics. In proof of this statement it is only necessary to point to the important discoveries made by medical officers working in Madras in connection with the causation of tropical diseases. When the pathological institute which is to be attached to the new Medical College is built, it will be possible to create a school of tropical medicine second to none in Calcutta or Bombay.

The great need of the hour is "research and more research" and persons with a passion for research. The circumstances of our young medical graduates are

not generally such as to allow them to carry on research for the love of it; nor have we any munificent foundations under the auspices of which select students can devote themselves to research work without at the same time having to earn their own livelihood by other work. In this connection, I am happy to report that the Government is instituting a research into the value of indigenous drugs. We are sometimes told that the average western doctor is not in sympathy with indigenous medical science: nothing can be farther from the truth. The man of science knows no distinction between eastern and western science; but is willing to take advantage of whatever good he finds in either. What the western doctor insists upon—and rightly so—is that all things should be proved before they are accepted, that nothing should be believed on mere authority, and that blatant quackery which does so much mischief in India should be exposed and replaced by that which is proved by experiment to be true and useful. The western doctor has already taken a number of the indigenous drugs of all countries into his pharmacopœia, and nobody will be more glad than he if the research contemplated bears fruit in this direction. Before any real advance in this direction can be taken it will be necessary to found a chair of experimental pharmacology in Madras and to import a specialist trained in pharmacological chemistry to investigate the active principles of any indigenous drugs that appear to be of real value.

**The Madras Medical Registration Act.**—It was with a view to a wholesome disciplinary control over the practitioners of the western system and to discourage quackery that the Madras Medical Registration Act (Act IV of 1914) was brought into being. There have been some misunderstandings regarding the object and working of this Act, but they are already disappearing, and I have no doubt that the Act has a great future before it, in giving a standing to the medical profession, and in conserving those ethical traditions for which in the west it is justly famous. One feature of a pleasing kind that has already made itself manifest is the better understanding produced between the official and non-official sections of the medical profession in South India.

**The Medical Services.**—It is my pleasing duty to place on record my high appreciation of the way in which the members of the Madras Medical Service have worked in face of the situation caused by the war. All but sixteen Indian Medical Service officers were reverted to military duty, twelve of whom were working in the city, three were in administrative charge of the Vizagapatam, Madura, and Nilgiri districts, and one was at the Pasteur Institute. Leave out of India for the Indian Medical Service has been stopped, and the only way leave in India could be got was by some other officer doing double work so as to let his comrade have much-needed rest. Many have had to do double work under these trying conditions. One retired Indian Medical Officer re-entertained is working in the city, while two others are acting as District Medical and Sanitary Officers, Kistna and Coimbatore districts.

## Correspondence.

### A SNAKE BITE (COBRA) CASE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—The following case is worthy of record:—

Name.—Singaram, age 25, Dhoby.

**History.**—On Friday (5th October, 1917) at 11 A.M., whilst working at a fence the patient felt a pricking sensation and saw some drops of blood on his forefinger. Almost immediately he recognised he had been bitten by a snake which was lying coiled with head up and hood expanded. With the assistance of his brother and friends the snake was killed and a

ligature was put around his wrist. He felt a peculiar tingling along the finger up to the wrist before the ligature was applied. He then walked a short distance to a tree under which he sat. A local expert arrived and prayed over him and then squeezed out some black blood. He lay down till 6 P.M.; when the ligature was removed, he walked to his house about 50 yards away. All that night he felt feverish and restless, and the numb sensation extended up the whole arm. The next morning the arm was swollen up to the elbow, the feverish symptoms still persisted, and he vomited again as he did the evening before. His bowels were opened and he passed urine. That night he went to the Tamil theatre on the advice of friends. On returning he tried to sleep but could not owing to the pain. On Sunday morning as the arm appeared more swollen he came into hospital.

**Condition on Admission.**—Well-developed, intelligent adult, pulse 76, temperature 98°. Index finger of right hand swollen, whole of dorsum and forearm in the same condition, apparently very painful on pressure. Two definite puncture marks with beads of crustod blood to mark them could be



plainly seen on the under finger. A peculiar blackish discoloration on the finger and of the hand dorsum due to an extravasation of blood was well marked.

**Progress.**—The œdema rapidly disappeared; but the finger and dorsum showed definite areas of sloughing which were removed on the 10th day after admission. As the extensor tendon of the index finger was involved in the process the resulting stiff finger was expected.

Complete healing took place about 2½ months after admission.

**Remarks.**—The snake 30" long was identified by Mr. C. Boden Kloss, Acting Director of Museums, as a young cobra (*Naga Tripudians Merrem*). Whether the recovery of the patient was due to an incomplete dosage, or the immaturity of the cobra, is a matter I am not prepared to express an opinion on.

Authentic cases of this nature are of very rare occurrence in this country and when associated with recovery appear to justify publication.

Yours, etc.,

P. H. HENNESSY.

### CASE OF TOXÆMIC JAUNDICE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Maung Po Tin, age 32, Burmese male, a cooly by profession, was admitted into the Bassein Civil Hospital in a moribund and semi-conscious condition on 24th August, 1917, suffering from characteristic yellow tinge of oyo-balls, conjunctive, tongue, lips, teeth, in fact of the whole body; looseness of bowels and vomiting of blood, weakness and slight fever of about 10 days' duration.

**Past History.**—The man who brought him, in a dooly, said that the patient came about a month ago from Yenangyaung to Bassein in search of work, and while he was working as a cooly he got this attack. So far as can be ascertained there was no history of malaria or syphilis; nor was he addicted to any drug habit, either opium, alcohol, or cocaine.

**Present Condition.**—Is unmarried. The patient appears a well-nourished subject, though thin at present; eyes, face,

tongue, gums, teeth, scalp and the whole body are highly tinged yellow. The mouth is covered with blood, the result of vomiting which stained the mouth.

**Circulatory System.**—Heart-apex, 1st sound is weak, 2nd sound is accentuated. Other sounds are also weak. No bruit. Pulse was 64 beats per minute, weak, slow, and soft.

**Respiratory System.**—Breath sounds are harsh but no crepitations are heard.

**Digestive System.**—Gums, tongue, mucous membrane of the lips and cheeks and teeth are highly tinged yellow. Bowels loose having about two motions in an hour. Motions are green and yellow, tinged with blood and mucus. He passes motions involuntarily. Vomits blood (hæmatemesis). Liver dullness extends 2½ inches below the right costal arch and on deep pressure tender.

**Blood,** examined, slight increase of polymorphonuclears present. No malarial parasite.

**Urine,** was bright yellow, and specific gravity 1.025. Reaction slightly acid. Bilc pigments present centrifugized a small quantity of urine, and examined microscopically no leucin or tyrosin crystals were found.

**Stools,** were examined, a few amœbæ were found.

**Treatment.**—Emetin injection gr. 2/3 every day for 6 days. For hæmatemesis, he was given a mixture of adrenalin chloride solution (1 in 1,000) calcium chloride with Dover's powder at bed-time.

Stools under emetin reduced in frequency and became devoid of blood and mucus and gradually assumed a normal appearance. The hæmatemesis also was controlled by the above mixture and entirely stopped on the third day after admission into hospital. On the 30th August, 1917, he was put on a mixture of ammonium chloride and bicarbonate of soda.

The jaundice by degrees disappeared and he made an eventful recovery, and was discharged cured on the 16th September, 1917, after stay of 24 days in hospital.

His temperature was not very high; it ranged between 99° and 100°, etc.

Yours, etc.,

C. R. CHETTI,

ASSISTANT SURGEON,

Civil Hospital, Bassein, Burma.

## TREATMENT OF ORIENTAL SORE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—For the last fifteen years Lieutenant-Colonel T. B. Kelly, I.M.S., had very encouraging results in the treatment of oriental sores with a broken surface by the local application of mercury in the form of blackwash or blue ointment. He could discharge such cases to duty within three weeks, but a much longer period was required when the case was seen in an early stage with an unbroken skin.

While in charge of the Oriental Sore Wards of the No. 83 Combined Stationary Hospital at Nasiriyah in 1917 and 1918, I have treated over 300 cases according to his method, the result of which I propose to publish later on. Colonel Kelly suggested that the treatment can be cut short, particularly in those cases where the skin surface is unbroken by mercury ionisation. I have so treated 100 cases which were bacteriologically positive to leishmania and had an unbroken surface, and also cases which did not yield to the ordinary routine mercury treatment.

**Technique adopted:—**

Ten thickness of lint soaked in perchloride of mercury solution 1 in 1,000 to 1 in 500 in distilled water, applied over the ulcer under the positive pole.

A current of 10 to 150 millimetre amperes, was employed according to the power of endurance of the patient. Most of the ulcers healed up in two exposures of 15 minutes each. The hard and indurated ulcers required three to four exposures of 50 to 150 millimetre amperes for 20 minutes each.

After the scainco the immediate result showed shrinking of the indurated tissue, and the skin became dry and brownish black like parchment. The hard indurated ulcers lose the discharge and dry up. The ulcers heal up from 10 to 21 days.

Yours, etc.,

J. L. SEN, M.C.,

CAPTAIN, I.M.S.

NASIRIYAH,  
14th February, 1918.

## THERAPEUTIC NOTICES

THE Nestlé and Anglo-Swiss Condensed Milk, Ltd., London, publish a pamphlet calling attention to the value in diarrhoea cases of condensed milk, diluted with rice water, and give several cases reported by Dr. P. Lassablière of the French Army. Our readers in India are well aware of the value, in chronic bowel complaints, of milk, *dahi* and rice water. We are not aware that any special antiseptic action and astringent action has even been proved to result from the use of rice water, but it is a demulcent and certainly easy of digestion, and no doubt the use of the pure condensed milk of the Nestlé firm would be preferable to the often impure and diluted milk of the Indian bazars.

### 'WELLCOME' BRAND TOILET LANOLINE.

ALTHOUGH primarily intended for toilet use 'Wellcome' Brand Lanoline is also suitable for application in many skin conditions for which purpose its great refinement and purity render it preferable to crude preparations of wool fat.

It is delicately perfumed and rubs readily into the skin without leaving any suggestion of a viscid film.

Messrs. Burroughs, Wellcome & Co. issue the preparation in collapsible tubes of two sizes. The screw-cap is of the improved style, familiar to users of the other products issued in tubes by the firm, large, easily removed and not readily mislaid.

### INGRAM'S APPLIANCES.

WE desire to call attention to the many useful novelties advertised in these columns by J. G. Ingram & Son, Ltd., of London. We hope to notice them more fully in a subsequent issue.

## Service Notes.

In the recent debate on the future of the Indian Medical Service on the motion brought forward by the Hon'ble Mr. Sastri in the Legislative Council in Delhi, Surgeon-General W. R. Edwards, C.B., C.M.G., made the following able speech in defence of the Service:—

"I need not dwell on the fact that this resolution is tantamount to the abolition of the distinguished service to which I have the honour to belong, but before proceeding with my reply I wish to say a few words concerning the work which has been done by this service in recent years and which is still being done, for I do not think that this Council is fully aware of the extraordinary value of the Indian Medical Service not only to India but to the world at large. I may begin by saying that no less than 34 members of the Indian Medical Service have gained that blue ribbon of the scientific world, the Fellowship of the Royal Society. This service has worked out the life-history of the malarial parasite, a discovery which has revolutionised our ideas concerning malaria and which, among other things, has enabled the Panama Canal to be successfully built. It has reduced the mortality of cholera by two-thirds and shorn amœbic dysentery of most of its terrors. Liver abscess as a consequence is no longer feared. It has worked the method of transmission of bubonic plague work which points the way to the ultimate eradication of that disease. Indian Medical Service officers have discovered the cause of relapsing fever and its means of transmission. Enlarged prostate, that terrible and fatal concomitant of old age, can now be overcome, thanks to a member of the Indian Medical Service and it was again an Indian Medical Service officer who invented the method of evacuating stone in the bladder by crushing. The work of Indian Medical Service men in the domain of eye surgery, more especially with regard to cataract and glaucoma, is recognised throughout the scientific world. This service discovered the origin of that dread disease kala-azar, which is now no longer

incurable. We are carrying out extensive investigations into ankylostomiasis, a disease which is costing India millions of pounds a year and also into bilharziosis which now threatens to invade India. Very important contributions to the knowledge of the world concerning snakes and their venom have been made and are being made by this service. An Indian Medical Service officer is the greatest living authority on goitre. I may also mention the valuable work done on short fevers and the method of transmission of disease which is of such world-wide importance.

"All this may be known to the Honourable Member, but if so it seems to me another case of a prophet not being without honour save in his own country. The Honourable Member will, no doubt, say that all this can be done by the service he proposes to create but I doubt it.

"I will only touch lightly on the magnificent educational work done by the Indian Medical Service. Our students compete with students in England and, according to the Honourable Member, are now fitted to replace the civil side of the Indian Medical Service. Sir George Makins told me that he was amazed at the perfection of our medical colleges and the completeness of their equipment. Expert professors could, of course, be especially engaged, but if men of the calibre of our present professors can be persuaded to come to India they will have to be paid from Rs. 4,000 to Rs. 5,000 a month and even then would not have that intimate knowledge of Eastern diseases which our men possess and which is of such vital importance. It must be borne in mind that very few Indian Medical Service officers make from £1,000 to £2,000 a year by private practice whereas successful men in England make from £5,000 to £15,000 a year. Let it not be forgotten, too, that Indians are freely admitted into the Indian Medical Service on the same terms as their British colleagues and their number is steadily increasing.

"Now, in peace time some 400 Indian Medical Service men hold civil posts in India, a mere drop in the ocean compared with the number of medical men that India should possess. Not long ago a distinguished Indian medical man, a member of the Bengal Legislative Council, stated that over 30,000 doctors were required in Bengal alone. There are at present only 2,000 on the medical register and of these some 40 are Indian Medical Service men. Would it benefit Bengal to take away these forty men or can this small band be said to be standing in the way of the aspirations of Bengal practitioners? I think not. Again, to cut India adrift from intimate medical contact with more progressive Western countries at the present time, and this would undoubtedly be the outcome of the resolution, is, I venture to say, a short-sighted policy. For it must be remembered that before the war Indian Medical Service officers were constantly availing themselves of study leave and were to be found in every great centre of medical learning in Europe. If I for a moment thought that the suggestions of the Honourable Member would make for increased efficiency I would not for one instant oppose him, nor would I make any effort to delay the breaking up of the Indian Medical Service.

"The Honourable Mr. Sastri pleads that the country is too poor to give the pay necessary to maintain the Indian Medical Service. A highly efficient body of medical men save the money spent on them one hundred times over provided they are made use of.

"Now I am coming to my point. Whether the Indian Medical Service is disbanded or not I am strongly in favour of a Provincial Civil Medical Service. Such services we have already but they might be greatly enlarged especially in their public health departments, and at the same time the old-fashioned name of assistant surgeon should be dispensed with and that hideous name sub-assistant surgeons forgotten.

"What could a separate Indian Medical Civil Service do that cannot be done by a Provincial Service? The civil side of the Indian Medical Service is quite a different matter. This service is the war reserve of the Indian Medical Service and the war reserve must undoubtedly be made use of by reserving for its members appointments in the Provincial Medical Services. This is practically what we are now doing. This service is the war reserve of the Indian Medical Service. I will make myself clearer. Every modern army must have a highly trained medical service whose officers may be regarded as specialists. They must be picked men of good physique, capable of accepting responsibility and of enforcing discipline. They must have plenty of initiative and be ready at all times to risk their lives under fire. They must be carefully trained for their special work and be exceptionally well acquainted with prophylactic medicine and hygiene. Their numbers must be sufficient to carry on all administrative appointments and all technical military medical work in time of war, and be capable at the same time of absorbing and utilising the services of a large number of surgeons and doctors who have received no

regular military training. Now the present cadre of the Indian Medical Service is none too large for the Indian Army and it forms a nucleus to which untrained medical men may be added. At the present time 340 of our reserve are back with the army and some 66 untrained practitioners have been absorbed. The war has taught us not that our reserve was unnecessary but that it was vital and not that it was too large or over-trained in purely military affairs, but that it was too small and undertained in military affairs. Nevertheless it was the existence of this reserve that enabled the Indian divisions when they proceeded overseas to go fully mobilised at the most critical period of the Empire's history. I cannot help thinking that the Honourable Mr. Sastri has not sufficiently weighed this aspect of the case. It is obvious that in peace time if military medical officers are to be kept fully employed less than half their numbers are amply sufficient to carry on routine duties. The Honourable Member may say, 'If this is so why is this not done in the R. A. M. C.?' My reply is that it would undoubtedly be done if the British Army in peace time were stationed in England and if there existed a civil medical service into which its surplus officers could be drafted. As it is the British Army is scattered all over the world, and I am quite certain that most of the R. A. M. C. officers would prefer to have more professional work to do in peace time.

"I will not weary the Council by saying more on the point but before touching on the second part of the resolution I think it my duty to inform the Council that the Indian Medical Service has lately ceased to attract medical men of the highest attainments either British or Indian. It must therefore be mended or ended and I unhesitatingly maintain that in the interests of India the former is the wiser course. The second part of the resolution depends on the class of medical men that it is desired to enlist into the Indian Medical Service. If first class men are required they must be sought in the open market and they must be paid their market value. I sincerely trust that none but the best will be considered good enough for India.

"The third part of the Honourable Member's resolution relates to the military assistant surgeons. In the past these men who serve only with the R. A. M. C. when in military employ have not been required to take a qualification recognised in Great Britain. It is proposed that in future they should do so and this will entail an entire re-consideration and reconstruction of their service. For the rest much of what I have said concerning the Indian Medical Service applies to them.

"I may conclude by saying that the Government of India have under consideration the complete reorganisation of both these services but cannot make any definite pronouncement of policy at present."

COLONEL W. H. B. ROBINSON, C.B., I.M.S., the newly appointed Surgeon-General with the Government of Bengal took over that office from Lieutenant-Colonel W. J. Buchanan, I.M.S. (who had been officiating), on 11th March, 1918.

THE number of casualties among officers reported during the fourteen days, 19th December, 1917, to 1st January, 1918, inclusive, was 1,564. The large number shown as missing is presumably due to the reverse at the end of the battle of Cambrai. They may be tabulated as follows:—

|               |     |     |     |       |
|---------------|-----|-----|-----|-------|
| Killed ...    | ... | ... | ... | 379   |
| Died ...      | ... | ... | ... | 16    |
| Wounded ...   | ... | ... | ... | 902   |
| Missing ...   | ... | ... | ... | 238   |
| Prisoners ... | ... | ... | ... | 29    |
| Total ...     | ... | ... | ... | 1,564 |

The number of casualties among medical officers reported was 39. The names are given below. All, unless otherwise stated, are temporary officers of the R. A. M. C.

*Killed or died of wounds.*—Colonel C. C. Fleming, D.S.O., (R. A. M. C., regular, reserve of officers); Captains N. McG. Smith, C. H. Robson, and H. M. Spoor, M.C. (accident); Surgeon K. M. Dyott, R.N.

*Died.*—Captains L. G. Crossman (T. F.); and W. E. Gibbons (T. F.); Surgeon-Probationer H. M. Macpherson, R.N.V.R.

*Wounded.*—Major P. A. Maplestone, D.S.O. (Australians); Captains D. T. Evans, J. F. W. Meenan (S. R.); A. E. Delgads (T. F.); P. J. O'Shea (Australians); J. Manuel, T. A. Townsend, C. Checchi (Australians); E. H. Lanson, J. R. Forde, R. G. Burnard (Australians); J. E. S. Smith (T. F.); F. G. Flood, M.C. (S. R.); D. M. Moffatt, M.C.; C. J. Timms, M.C.; L. R. Hill, W. K. Turner (Canadians); W. C.



Douglass, Lieutenants E. C. Owens, G. Gordon, S. G. Johnson; Surgeon-Probationer H. Gordon, R.N.V.R.; Staff Nurse E. King, Q.A.I.M.N.S.R.

*Missing.*—Captains F. W. Fawcett, H. B. Goulding (S.R.); J. Davidson, H. H. Fairfax, G. A. D. McArthur, Lieutenants A. S. Gariwal (I. M. S.); and T. F. Ryan

*Prisoner.*—Surgeon-Probationer P. A. Faichney, R.N.V.R.

Colonel Charles Christie Fleming, D.S.O., R.A.M.C., died on 21st December, 1917, of wounds caused by a bomb on the previous day, aged 53. He was the son of the late Deputy Surgeon-General Andrew Fleming, was born on 6th November, 1864, and was educated at Edinburgh University, where he graduated as M. B. and C. M. in 1888. After filling the posts of Resident Physician and Resident Surgeon in the Edinburgh Royal Infirmary, and of Resident Physician to the Royal Hospital for Sick Children, Edinburgh, he entered the R. A. M. C. as Surgeon-Lieutenant on 30th January, 1892, becoming Surgeon-Captain on 30th January, 1895, and Major on 30th January, 1904, and retiring on 29th October, 1910. On retirement he joined the Reserve of Officers. He also acted for some time as secretary to the Scottish Branch of the British Red Cross Society. He rejoined for duty on 17th April, 1915, in his old rank of Major, had risen to Colonel during the war, and at the time of his death was A. D. M. S. of the Highland Division. He served in the Nile campaign of 1898, as senior medical officer in the operations on the Upper Atbara, in the action at Gedaref, and in the defence of Gedaref; was mentioned in despatches in the *London Gazette* of 9th December, 1898, and received the medal, the Egyptian medal, and the D. S. O. He also served in the South African war from 1899 to 1902, when he took part in the advance on Kimberley, including the battles of Belfont and Magersfontein, in the relief of Kimberley, and in the operations in Cape Colony and in the Orange River Colony, receiving the Queen's medal with five clasps and the King's medal with two clasps.

Surgeon Kensing Mitchell Dyott, R.N., was killed in action on 13th December, 1917. He qualified as L.M.S.S.A. in 1915, and immediately after took a temporary commission in the Royal Navy, from 24th July, 1915. He was the youngest son of the late George R. Dyott, of Derby.

Captain Norman McGavin Smith, R.A.M.C., was reported as having died of wounds, in the casualty list published on 22nd December, 1917. He was educated at Glasgow University, where he graduated as M. B., and Ch. B. in 1915, joining the R.A.M.C. soon after as a temporary Lieutenant.

Captain Charles Henry Robson, R.A.M.C., was killed in action on 2nd December, 1917. He was the eldest son of Alfred Robson, of Whitley Bay, and was educated at Newcastle-on-Tyne, graduating as M. B. and B. S. of Durham in 1913. He took a temporary commission as Lieutenant in the R.A.M.C., on 10th October, 1914, and was promoted to Captain after a year's service. He served in Gallipoli in 1915, and in France in 1916-17.

Surgeon-Major John Robb, Bombay Medical Service, retired, died at Aberdeen on 20th December, 1917, aged 74. He was educated at Aberdeen University, where he graduated as M. B. and C. M., with honours, in 1868, and as M. D., in 1876. Entering the I.M.S., as Assistant-Surgeon on 1st October, 1863, he became Surgeon on 1st July, 1873, and Surgeon-Major on 1st October, 1883, retiring on 2nd November, 1889. From 1873 to 1882 he was Residency Surgeon at Zanzibar, also acting from time to time as Assistant Political Agent, and subsequently served successively as Civil Surgeon at Aden, Surat and Ahmedabad. He was the author of "A Medicotopographical Report on Zanzibar," published in 1879.

Captain Herbert Mather Spoor, M.C., R.A.M.C., was reported as having been accidentally killed, in the casualty list published on 29th December, 1917. He was educated at Edinburgh University, where he graduated as M. B., and Ch. B., in 1903, and then went into practice at Stoke, Rochester, where he held the appointment of Superintendent of the Hoo Isolation Hospital. He joined the R.A.M.C., as a temporary Lieutenant on 17th April, 1915, was promoted to Captain after a year's service, and received the Military Cross on 26th September, 1917.

Captain Wilfred Ernest Gibbons, R.A.M.C. (T.F.), died after an operation, aged 48, in the 5th Northern General Hospital, Leicester, on 20th December, 1917. He was educated at Edinburgh University, where he graduated as M. B. and C. M. in 1896, and as M. D. in 1900. After acting as House Surgeon of the Edinburgh Royal Infirmary, he went into practice at Leicester, and was a member of the staff of the hospital in which he died.

Captain Lionel Gordon Crossman, R.A.M.C., (T.F.), died on December, 1917, of pneumonia. He was the younger son of Councillor John Crossman of Penllwyn Park, Carnarthen, and was educated at University College, Cardiff, and at St. Bartholomew's hospital, graduating as B.Sc., Wales in 1910, and as M. B. and B. S. London in 1913, also taking the

M.R.C.S. and L.R.C.P., London in 1912. After filling the post of Clinical Assistant in the Great Osmond Street Hospital for Sick Children, Senior House Physician at Bart's and Resident Medical Officer of the Royal Hospital for Diseases of the Chest in City Road, London, he went into practice at Arybryn, Carmarthen. He took a commission as Lieutenant in the 1st City of London General Hospital on 5th September, 1914, was promoted to Captain after a year's service, and had been serving in the Eastern Expeditionary Force for about eighteen months.

Surgeon-Probationer H. M. Macpherson, R.N.V.R., was reported as having died on service, in the casualty list published on 31st December, 1917.

THE number of casualties reported among officers, during the fourteen days, 2nd to 15th January, 1918, inclusive, amounted to 1,191, a smaller number than for some time past. The large number reported as prisoners are evidently from the set back near Cambrai. These casualties may be tabulated as follows:—

|           |     |     |       |
|-----------|-----|-----|-------|
| Killed    | ..  | ... | 301   |
| Died      | ..  | ... | 27    |
| Wounded   | ..  | ... | 596   |
| Missing   | ..  | ... | 78    |
| Prisoners | ... | ... | 189   |
| Total     |     |     | 1,191 |

Among them are included 36 casualties to medical officers. The names are given below. All, unless otherwise stated, are temporary officers of the R.A.M.C.

*Killed.*—Captain J. McK Ferguson.

*Lost at Sea.*—Dr. J. E. L. Johnston (W.A.M.S.); Dr. H. L. Burgess (W.A.M.S.); Sister N. Hawley (Q.A.I.M.N.S.); Misses H. A. Rogers, W. M. Brown, C. Ball, L. Midwood, (all V.A.D.).

*Died.*—Captains A. Robb-Smith, R. S. Smith (Canadians); S. H. Morris, S. G. Scott, R. M. Cunningham (Australians); Sister F. Astell, (T.F.N.S.).

*Wounded.*—Captains J. F. Matheson, J. W. Macfarlane, H. N. Collier (T.F.); J. H. Jordan, G. R. Grant, M.C. (S.R.); F. M. S. Hulke, F. B. Julian, H. Dilman (Australians); H. S. Secombe (Australians); J. H. Barry, D.S.O., M.C.; T. M. Crawford, A. Ramsbottom (T.F.); L. Zealand, J. G. Hill (T.F.); Lieutenants W. H. Newton, G. H. G. Davie, J. W. Lindsay; Captain and Quartermaster C. W. Fraser (T.F.).

*Missing.*—Captains H. G. Clementi-Smith (T.F.), A. G. Boyce.

*Prisoners.*—Lieutenant-Colonel H. C. D. Rankin (R.A.M.C.); Captains C. F. Dillon-Kelly, H. H. Fairfax, E. L. Nash, H. G. Clementi-Smith, F. B. Ryan; Lieutenants A. S. Gariwal (I.M.S.), T. F. Ryan.

Captain Alec Robb-Smith, R.A.M.C., was reported as having died on service, in the casualty list published on 2nd January, 1918. He was educated at Glasgow University, where he graduated as M. B. and C. M. in 1892. After filling the posts of Medical Superintendent of Paisley Infirmary and Fever Hospital, of Gockston Smallpox Hospital, and of Croydon Borough Hospital, he went into practice at Chislehurst, in Kent. He took a temporary commission as Lieutenant in the R.A.M.C. in 1915, and was promoted to Captain after a year's service.

Captain James McKee Ferguson, R.A.M.C., was reported as killed in action, in the casualty list published on 5th January, 1917. He was educated at Belfast University, where he graduated as M.B., B.Ch., and B.A.O. in 1914, took a temporary commission as Lieutenant in the R.A.M.C. on 14th December, 1914, and was promoted to Captain on completion of a year's service.

Dr. John Edward Lionel Johnston, of the West African Medical Service, was lost at sea, on a torpedoed ship, on or about 9th November, 1917. He was the youngest son of J. E. Johnston, of Bath, and was educated at St. Mary's Hospital, where he gained the Open Entrance Scholarship in 1903. He graduated as M. B. and B. S. London in 1909, also taking the M.R.C.S. and L.R.C.P. London in the same year, and the Diploma in Tropical Medicine and Hygiene in 1912. After acting as Junior Clinical Ophthalmic Assistant, as House Surgeon, and as House Physician at St. Mary's, he entered the West African Medical Staff; and had recently been seconded as one of the special investigators under the West African Yellow Fever Commission. He was the author of many papers on Tropical Medicine.



Captain R. S. Smith, of the Canadian Army Medical Corps, was reported as having died on service, in the casualty list published on 2nd January, 1918.

Captain Robert Milman Cunningham, Australian Army Medical Corps, died suddenly on 10th December at Latsope, Tasmania. He was the elder son of the late Surgeon-Major R. W. Cunningham, I.M.S., and was educated at Glasgow University, where he graduated as M.B. and Ch. B. in 1916.

THE obituary notices of the *Times* and *Daily Telegraph*, from 8th to 11th January, 1918, contained the names of several nurses, who were lost at sea in a ship torpedoed in the Mediterranean on 31st December, 1917. No official notification having been made, it cannot be stated whether this was a hospital ship on which they were serving, or whether they were passengers on a transport. The names are:—Miss Nellie Hawley, Q.A.I.M.N.S., daughter of Alfred Arthur Hawley, of Beckenham; Miss Hermione Angela Rogers, 14th Wilts V. A. D., elder daughter of Francis Edward Rogers, of Rainscombe, Pensey, Wilts; Miss Winifred Maud Brown, V.A.D., younger daughter of Arthur Brown, of Nottingham; Miss Lilian Midwood, V.A.D., daughter of Mr. E. G. Midwoods, of 71 Frichley Road, London, N. W.; and Miss Catherine Ball, V.A.D.

CAPTAIN SAMUEL GODFREY SCOTT, R.A.M.C., died on 6th January, 1918, at a casualty clearing station, on active service, of pneumonia, aged 42. He was the eldest son of the late Canon S. G. Scott, and was educated at St. Thomas' Hospital, and at Oxford, where he graduated as B.A. in 1897, and as M.B., B.Ch., and M.A. in 1902. After serving as Clinical Assistant in the Throat Department at St. Thomas, and as Demonstrator of Pathology in Leeds University, he settled at Oxford, where he was Demonstrator of Histology to the University, till he took a temporary commission in the R. A. M. C. He was the author of numerous contributions to the medical and scientific journals.

CAPTAIN SYDNEY HERBERT MORRIS, R.A.M.C., died in the London Hospital on 11th January, 1918, aged 42. He was educated at Edinburgh University, where he graduated as M. B. and B. Ch. in 1899. After filling the posts of House Surgeon at the Seaman's Hospital, Greenwich, and at the Poplar Hospital, he went out to South Africa, where he served as District Surgeon and later as acting Principal Medical Officer to the British South Africa Administration; and was also a Justice of the Peace for North-East Rhodesia. On his return to England he settled at Frizington in Cumberland, where he held the appointments of Parochial Medical Officer and Public Vaccinator, Certifying Factory Surgeon, and Medical Officer to the Port Office, till he took a temporary commission in the R. A. M. C.

DR. HAROLD LYNCH BURGESS, of the West African Medical Staff, was lost at sea in a torpedoed ship towards the end of 1917. He was educated at the London Hospital, where he gained a prize in Surgery in 1898, and took the M.R.C.S. and L.R.C.P. London in 1903, and also the certificate of the London School of Tropical Medicine in 1905. After filling the posts of House Surgeon and Casualty Officer to the North East London Hospital for Children, he joined the West African Medical Staff. In 1913 he was seconded for special service at the Colonial Office, and had since served as Medical Secretary to the Advisory Medical and Sanitary Commission for Tropical Africa, and to the West Africa Yellow Fever Commission.

THE following appointment are gazetted in *Gazette of India*, dated 9th February, 1918:—

*Deputy Director of Medical Services.*

Colonel P. Hehir, C.B., C.M.G., Indian Medical Service. Dated the 14th June, 1917.

*Assistant Directors of Medical Services.*

Lieutenant-Colonel J. B. Smith, Indian Medical Service. Dated the 11th May, 1917.

Colonel C. R. M. Green, Indian Medical Service. Dated the 14th May, 1917.

Colonel P. Hehir, C.B., C.M.G., Indian Medical Service. Dated 26th May, 1917.

Lieutenant-Colonel L. Addams-Williams, Royal Army Medical Corps. Dated the 9th June, 1917.

Lieutenant-Colonel J. Hennessy, C.B., Royal Army Medical Corps. Dated the 27th June, 1917.

Lieutenant-Colonel V. E. H. Lindesay, Indian Medical Service. Dated the 13th July, 1917.

Brevet-Colonel D. J. Collins, Royal Army Medical Corps. Dated the 22nd July, 1917.

*Deputy Assistant Directors of Medical Services.*

Captain J. A. Sinton, V.C., Indian Medical Service. Dated the 11th May, 1917.

Major J. E. H. Gatt, Royal Army Medical Corps. Dated the 18th May, 1917.

Captain J. M. Weddell, Royal Army Medical Corps. Dated the 5th June, 1917.

Major W. R. Dutton, Indian Medical Service. Dated the 13th June, 1917.

Major R. L. Popham, Royal Army Medical Corps. Dated the 14th June, 1917.

Captain P. M. Rennie, Indian Medical Service. Dated the 27th June, 1917.

SUBJECT to His Majesty's approval, the undermentioned temporary Lieutenant, Indian Medical Service, is permitted to resign the service with effect from the date specified:—  
A. M. Ahmed, 8th January, 1918.

CIVIL SURGEON RAI BHARAT CHANDRA DHAR BANADUR made over charge of the Krishnagar Jail to Assistant Surgeon Dharendra Nath Sou on the forenoon of the 5th February, 1918.

IN accordance with Rule 3 of the Regulations of the Central Provinces Medical Examination Board, the Chief Commissioner was pleased to appoint the following persons as members of the Board:—

*President.*—The Hon'ble Colonel W. H. B. Robinson, C.B., I.M.S., Inspector-General of Civil Hospitals, Central Provinces.

*Members.*—Lieutenant-Colonel A. Buchanan, M.A., M.D., M.Ch., M.A.O., I.M.S., Superintendent, Robertson Medical School, Nagpur; Lieutenant Colonel W. H. Kenrick, L.R.C.P., M.R.C.S., D.T.M., I.M.S., Civil Surgeon, Jabulpore; Lieutenant-Colonel C. H. Bensley, M.R.C.S., L.R.C.P., I.M.S., Inspector-General of Prisons, Central Provinces; Rai Sahib Bipin Bihari Gupta, L.M. & S., Civil Surgeon, Raipur; Rai Bahadur Surendra Nath Barat, M.B., Civil Surgeon, Wardha.

SUBJECT to His Majesty's approval the undermentioned to be temporary Captain with effect from the date specified:—

George Hugh Kidd Macalister, 1st October, 1917.

Subject to His Majesty's approval, the undermentioned to be temporary Lieutenants with effect from the dates specified:—

Abdul Kadir Muhammad Mahiuddin, 8th January, 1918; Alexander Noble, 8th January, 1918; Dinesh Chandra Chakrabatti, 12th January, 1918.

MAJOR C. S. LOWSON, I.M.S., was granted 9 months' combined leave with effect from 14th October, 1916, and this is gazetted in February, 1918.

IN pursuance of section 3 of the Indian Medical Degrees Act, 1916 (VII of 1916), the Governor-General in Council is pleased to authorise the institution known as the Central Provinces Medical Examination Board to confer, grant, or issue in British India degrees, diplomas licenses, certificates or other documents stating or implying that the holder, grantee, or recipient thereof is qualified to practise Western medical science.

THE Governor of Bombay in Council is pleased to make the following appointments:—

Lieutenant-Colonel J. B. Smith, M.B., M.Ch. (R.U.I.), D.P.H. (Cant.), I.M.S., on reversion to civil employment, to be Civil Surgeon and in medical charge of the B. J. Medical School, Poona.

Lieutenant-Colonel A. Hooton, I.M.S., on relief, to act as Surgeon, Gokaldas Tezpal Native General Hospital,

Bombay, vice Lieutenant-Colonel S. C. Evans, M.B., C.M. (Edin.), I.M.S., pending further orders.

CIVIL SURGEON HEM CHANDRA SARKAR made over charge of the Malda Jail to Assistant Surgeon Abinash Chandra Chatterji on the forenoon of the 8th February, 1918.

FIRST GRADE ASSISTANT SURGEON DIWAN BAHADUR HIRA LAL BASU, F.R.F.P.S. (Glas.), is granted extraordinary leave without allowance for two years, under article 339 of the Civil Service Regulations, with effect from the 9th February, 1918, in extension of the leave already granted to him in Notification No. 213, dated the 9th January, 1917.

THE *London Gazette* announces the following awards to officers of the Indian Army :—

D. C. M.

Assistant-Surgeon R. H. Parkinson. Throughout an action he remained in close contact with the fighting troops and by his cool courage and professional skill the wounded were dressed and evacuated with the utmost despatch. He performed magnificent work in intense heat.

Assistant-Surgeon R. H. Parkinson was born in 1886, and entered the service in March, 1908.

THE services of Major L. P. Stephen, M.B., F.R.C.S. E., I.M.S., are replaced at the disposal of the Government of Bombay with effect from the date on which he is relieved of his military duties.

THE services of Assistant-Surgeon Hira Singh are placed at the disposal of the Chief Commissioner of Delhi with effect from the forenoon of the 5th January, 1918.

HIS Majesty the King has been pleased to approve of the grant of the honorary rank of Major to the undermentioned Officers, in recognition of distinguished service in the field during the present war, with effect from 1st January, 1917, inclusive :—

Senior Assistant Surgeon and Honorary Captain Richard Thomas Murphy, Indian Sub-Medical Department; Senior Assistant Surgeon and Honorary Captain George Oswald Weston, Indian Sub-Medical Department.

THE following is a continuation of Sir Douglas Haig's Despatch of 7th November, submitting names deserving special mention, published in a Supplement to the *London Gazette* of Friday, 28th December, 1917 :—

#### Indian Medical Service.

Fleming, Lieut.-Col. A. N., M.B., F.R.C.S.; Urwin, Major J. J., M.B., F.R.C.S.

THE following promotions are made subject to His Majesty's approval :—

Majors to be Lieutenant-Colonels, I.M.S., with effect from 28th January, 1918 :—

Henry Kirkpatrick, M.B.; Frederik Durand Sterling Fayrer; Padmakar Krishna Chitale; Thomas Hunter, M.D.; Walter Rothney Battye, D.S.O., M.B., F.R.C.S.; George Hutchison, M.B.; William Glen Liston, M.D., C.I.E.; Harold Boulton, M.B. (Brevet Lieutenant-Colonel); Richard William Anthony, M.B., F.R.C.S.E.; Ernest Frederik Gordon Tucker, M.B.; George Edward Stewart, M.B., F.R.C.S.E.; Frank Stuart Corbitt Thompson, M.B.; Thomas Shepherd Norris, F.R.C.S.; and John William Watson.

SUBJECT to His Majesty's approval, the undermentioned temporary Lieutenants to be temporary Captains with effect from the dates specified :—

Lalit Mohan Banerjee, 1st July, 1917; Umedram Lalhai Desai, 29th July, 1917.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants with effect from the dates specified :—

Maniketh Vythi Menon, 5th April, 1917; Annasamy Muthukrishnan, 18th January, 1918.

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Rash Behari Dutta, I.M.S., are dispensed with on account of ill-health, with effect from the 15th January, 1918.

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Bishendas Soni, I.M.S., are dispensed with on account of medical unfitness, with effect from the 13th December, 1917.

THE following Sub-Assistant Surgeons, employed on temporary military duty, are (para. 16 A. R. I., Vol. VI) granted while so employed military rank as shown below :—

#### Temporarily Ranking as Warrant Officers.

Bhawani Das Shah, 6th May, 1916; Amar Chand Bhardwaj, 17th August, 1916; Gokaldas Ranchhoddas Vijapura, 3rd September, 1916; Ganga Sahai Johri, 29th September, 1916; Jiwanlal Durlaji Vyas, 18th October, 1916; Muhammed Saidur Rehman, 21st October, 1916; Haran Chandra Sen, 21st October, 1916; Binod Chandra Sen Gupta, 28th October, 1916; Bhawani Das Dua, 6th November, 1916; Moimudin, 21st November, 1916; Ramkrishna Shridhar Bag, 24th November, 1916; Bulagui Ram, 6th December, 1916; Gajendra Thapa, 8th February, 1917; Rikhi Kesh Abrole, 24th February, 1917; Shaikh Faiz Ahmed, 20th March, 1917; Hari Ram, 10th April, 1917; Shankar Vishwanath Kale, 14th June, 1917; Yashwant Jeyram Sane, 14th June, 1917; Surya Kumar Dutta, 18th June, 1917; Vyankatesh Rama Kant Sarap, 23rd June, 1917; Vishnuprasad Trimbuklab Baxi, 25th June, 1917; Banka Behari Das, 26th June, 1917; Manohar Lal, 27th June, 1917; Prafulla Kumar Sen Gupta, 28th June, 1917; Jatindra Mohan Nag, 6th July, 1917; Akbar Ali Musaji, 11th July, 1917; Urjan Lakshmi, 9th July, 1917; Tejumal Holaram Batria, 29th July, 1917; Bhavani Venkataramana Venkatakrishnan, 9th August, 1917; Pattarumbil Kaat Karunakaran Nair, 24th August, 1917; Babu Panindra Nath Chatterji, 26th August, 1917; Badri Narain, 2nd September, 1917; Parshotam Sarup, 9th September, 1917; Biharilal Vansh, 19th September, 1917; Nanak Chand, 8th October, 1917; Jiban Krishna Chatteraj, 2nd November, 1917; Digendra Kumar Chakravarti, 7th November, 1917; Dhirendra Chandra Sen Gupta, 17th November, 1917; Bhabesh Chandra Sen, 18th November, 1917; John Ralph Hopper, 24th November, 1917; Sant Singh, 28th November, 1917; Chuni Lal, 29th November, 1917; Rekha Singh, 1st December, 1917; Madho Ram Tewari, 1st December, 1917; Ram Chandra Shanker Kibe, 2nd December, 1917; Pirvaji Gopal Bhatt, 6th December, 1917; Wasudeo Bhagwant Kulkarni, 6th December, 1917; Krishnalal Harilal Khabaria, 6th December, 1917; Gunvantra Narbadashanker Pathak, 8th December, 1917; Shankar Bal Krishna Mukadam, 10th December, 1917; Jagdamba Parsad, 21st December, 1917; Lachhmi Narain, 23rd December, 1917; Eknath Ranchandra Shettle, 25th December, 1917; Dial Chand, 27th December, 1917; Jaishiram Mehta, 31st December, 1917; Ganga Bishu Dube, 28th January, 1918.

THE Governor General in Council is pleased to sanction, under the provision of paragraph 470, Army Regulations, India, Volume II, the special promotion of the undermentioned Indian warrant officers, non-commissioned officers and men for services during the war :—

The promotions will have effect from the 1st January 1918, unless otherwise stated.

#### Indian Subordinate Medical Department (Bengal).

1st Class Sub-Assistant Surgeon Dula Ram to be 2nd Class Senior Sub-Assistant Surgeon, ranking as Jemadar.

1st Class Sub-Assistant Surgeon Donlat Singh, I.O.M., to be 2nd Class Senior Sub-Assistant Surgeon, ranking as Jemadar.

1st Class Sub-Assistant Surgeon Narayan Parshad Sukul, I.O.M., to be 2nd Class Senior Sub-Assistant Surgeon, ranking as Jemadar.

1st Class Sub-Assistant Surgeon Nagina Singh to be 2nd Class Senior Sub-Assistant Surgeon, ranking as Jemadar.

1st Class Sub-Assistant Surgeon Deo Raj, Rai Sahib. Date of promotion to 1st Class Sub-Assistant Surgeon to be antedated to 29th April, 1916.

2nd Class Sub-Assistant Surgeon Aswini Kumar Sarkar to be 1st Class Sub-Assistant Surgeon, with effect from 3rd April, 1917.

3rd Class Sub-Assistant Surgeon Chamman Lal to be 2nd Class Sub-Assistant Surgeon.

3rd Class Sub-Assistant Surgeon Alah-ditta to be 2nd Class Sub-Assistant Surgeon.

*Indian Subordinate Medical Department (Madras).*

1st Class Sub-Assistant Surgeon Muhammad Riazuddeen to be 2nd Class Senior Sub-Assistant Surgeon, ranking as Jemadar.

2nd Class Sub-Assistant Surgeon V. K. Nasiruddin to be 1st Class Sub-Assistant Surgeon, with effect from 12th March, 1917.

MR. P. M. RELIAPPA, Assistant Surgeon, Mercara, held charge of the current duties of the Civil Surgeon of Coorg in addition to his own duties during the absence of Lieutenant-Colonel E. Hassell Wright, I.M.S., on privilege leave for 23 days with effect from the 10th November, 1917, and leave on urgent private affairs for one month, with effect from the 12th December, 1917.

CAPTAIN P. TOOMY, I.S.M.D. (Retired) has been appointed as Assistant Plague Medical Officer, Punjab, with effect from the forenoon of the 24th January, 1918.

THE undermentioned passed students of the Medical College, Calcutta, are temporarily admitted into the service of Government as Assistant Surgeons, with effect from the dates mentioned against their names, viz.:-

Babu Charu Chandra Banerji, M.B.—28th January, 1918.  
Babu Indra Bhusan Majumdar, M.B.—31st January, 1918.  
Babu Bhagbat Bhusan Sinha, M.B.—31st January, 1918.  
Babu Bankim Chandra Banerji, M.B.—31st January, 1918.  
Babu Harendra Nath Bagchi, M.B.—1st February, 1918.  
Babu Rash Bihari Datta, L.M.S.—29th January, 1918.

DR. C. H. ELNES, M.B., Ch.B., is temporarily appointed to be Health Officer of the Port of Calcutta, until further orders.

FIELD MARSHAL HAIG in his despatch dated France, 7th November, 1917, mentions the names of the following I.M.S. Officers for "distinguished and gallant services and devotion to duty":—

Lieutenant-Colonel T. A. Granger, I.M.S.  
Lieutenant-Colonel A. J. MacNab, F.R.C.S., I.M.S.

THE Distinguished Conduct Medal for gallantry and distinguished conduct in the field has been awarded by the King to:—

Assistant-Surgeon E. A. Cotton, I.S.M.D.  
Assistant-Surgeon E. B. Holt, I.S.M.D.

IN exercise of the powers conferred by article 6 of the Statutes of the State Medical Faculty of Bengal (published under this Government Resolution No. 2345-Medl., dated the 11th August, 1914, at pages 1553—1562 of Part I of the *Calcutta Gazette* of the 12th idem), the Governor in Council is pleased to direct that the following addition be made in the Schedule (as revised by Notification No. 424-Medl., dated the 2nd March, 1915), annexed to the said Statutes, viz.:-

Add the following Note after paragraph 3 of the "Interpretation Clauses":—

"Note.—Students who undertake Military or Naval service or training for any period in connection with the present war will, for purposes of admission to their respective examinations, be deemed to have attended all lectures and practical classes during such period in their respective classes in a recognized Medical college or school in the subjects prescribed for the examinations, provided (i) that they produced certificates of having been in such service from the officer under whom they have been in service or training, and (ii) that they produce certificates from the head of their college or school to the effect that they have taken a satisfactory course of lectures and of practical work in those subjects."

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, I. M. S., with effect from the dates specified:—

Kshetra Mohan Ray, 14th August, 1917; Bhuthapuri Krishnayya, 2nd January, 1918; Kalidas Bagchee, 14th January 1918; Ravu Venkata Rau, 18th January, 1918; Sadashiva Chintamon Lele, 19th January, 1918; and Jagdish Chandra Gupta, 25th January, 1918.

SUBJECT to His Majesty's approval, the undermentioned to be honorary temporary Lieutenant, I. M. S., with effect from the date specified, for the period of his honorary service at Meerut:—

Chandi Pershad Trivedi.—17th December, 1917.

THE admission of 1st Class Senior Sub-Assistant Surgeon Gauri Shankar, I.O.M., Indian Subordinate Medical Department, to the 2nd Class Order of British India, published in Army Department Notification No. 5, dated the 1st January, 1918, is cancelled, this Indian officer having died on field service on the 19th October, 1917.

THE following promotions are made, subject to His Majesty's approval:—

*Captains to be Majors.*

Dated 1st February, 1918.

Khandu Ganpatrao Gharpurey, Percy Strickland Mills, M.B., Desmond Charles Villiers FitzGerald, M.C., Robert Siggins Kennedy, M.C., M.B., Bernard Higham, M.B., Patrick Heffernan, M.B., Frank Phillips Wernicke, M.B., Henry Stewart Hutchison, M.B., Robert George Gibbon Croly, M.B., Stanley Trefusis Crump, and James MacGregor Skinner, M.B.

These officers received their first commissions on 1st February, 1906, and were promoted to the rank of Captain on 1st February, 1909.

IN supersession of the Home Department Notification No. 6-14-C., dated the 30th November, 1917, Major J. N. Walker, M.R.C.P., I.M.S., is appointed to be Professor of Medicine, King George's Medical College, Lucknow, substantively *pro tempore* with effect from the 15th December, 1917, until further orders.

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters, and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 12, including postage, in India. Rs. 14, including postage abroad.

## BOOKS, REPORTS, &c., RECEIVED:—

Madras Hospital Report.  
Madras Asylums Report.  
Ajmer-Merwara Report.  
Baluchistan Agency Report.  
Lt.-Col. E. E. Waters' Diabetes. Thacker, Spink & Co.  
Sir R. Godlee's Life of Lord Lister. Macmillan & Co.  
Pusa Agricultural Institute, Bulletin No. 76.  
R. L. Spittel's Surgery. Butterworth & Co., Calcutta.  
Webb-Johnson's Painless Child-birth. Butterworth & Co.  
Proc. of Kathiawar Medical Society.

## LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

Surgn.-Genl. Edwards, Delhi; Surgn.-Genl. Giffard, Madras; Lt.-Col. W. D. Sutherland, Calcutta; Col. W. G. Denny, I.M.S. (Retd.), Shillong; Col. P. Hehir, I.M.S., Rawalpindi; Capt. J. D. Sandes, I.M.S., Calcutta; Lt.-Col. C. Fearnside, I.M.S., Coimbatore; Babu Sukes Lochan Sen, Karanjia; Dr. Hennessey, Kuala Lumpur; Capt. J. D. Sandes, I.M.S., Calcutta; Capt. J. R. James, I.M.S., Lucknow; Capt. T. Crawford Boyd, I.M.S., Lahore; Capt. J. L. Sen, I.M.S., Nasiriyah; Lt.-Col. J. C. Vaughan, I.M.S., Ranchi.

## Original Articles.

### SODIUM ANTIMONYL TARTRATE VEL TARTAR EMETIC IN KALA-AZAR.

BY SIR LEONARD ROGERS, M.D., F.R.C.P., F.R.S., I.M.S.,

*Professor of Pathology, Calcutta.*

#### I. THE TOXICITY OF TARTAR EMETIC.

In a previous paper(1) I reported two very debilitated cases of kala-azar who died with symptoms of collapse a few hours after the intravenous injections of full doses of tartar emetic, and I suggested the careful trial of antimonyl sodium tartrate, which has been used in trypanosomiasis and also in isolated cases of kala-azar with apparent success, especially by the physicians of the Campbell Hospital in Calcutta. In May 1917, I carried out some experiments with pigeons and rabbits to test the relative toxicity intravenously of tartar emetic and sodium antimonyl tartrate, and found the sodium salt possessed a distinctly, but slightly, lower minimal lethal dose for both species of animals than tartar emetic; so determined to give sodium antimonyl tartrate a prolonged trial, under similar conditions to those under which I had previously used tartar emetic, to determine the relative value of the two salts. Before I had been able to carry out this intention, an accident occurred which greatly enhanced the importance of doing so.

*Fatalities due to the precipitation of tartar emetic solutions.*—In a Calcutta hospital, during over two years, many hundred doses of tartar emetic up to doses of 10 c.c. of a 2 per cent. solution had been given in kala-azar without harm, but with great saving of life. The solutions were made up and sterilized in my laboratory in small flasks plugged with cotton-wool. One day three children were given the same dose that they had previously received without any marked reaction a few days before. All three became seriously collapsed within a few hours, and one very emaciated child of 4 years of age died. The other two had very severe febrile reactions, with temperatures rising to 105.6 and 106 F. respectively, but recovered after normal saline had been given by the rectum and subcutaneously. Strange to say, both subsequently remained entirely free from fever, although suffering from low intermittent pyrexia previously, and both made rapid and complete recoveries and were discharged cured. They had previously had 16 injections each and had improved considerably. Chart 1 shows the temperature during the severe reaction, the two previous injections of the same dose, namely, 3 c.c., and the normal temperature after the high rise. On examining the flask of solution used in these cases it was found to contain a heavy white

precipitate, which had unfortunately been overlooked by the house physician who gave the injections, although I had warned against using any solution which was not perfectly clear.

Some six weeks later another Indian house physician, who had been posted to the hospital subsequently to the previous accident, and was ignorant of it, used a similar precipitated solution in three male patients; they also had high febrile reactions and collapse within a few hours, and two of them died in spite of intravenous saline being given in one of them. Rapid and rather deep respirations were a feature of the symptoms. In both, the doses were comparatively small ones, namely 5 and 6 c.c. respectively, or about half of what has repeatedly been given before with safety, while in both the dose was exactly the same as had been previously given in the same patients five and six times respectively. Chart 2 shows the high rise of temperature to 105.8 F. during a fatal reaction and the slight reactions after five previous doses, clearly indicating that some change had taken place in the solution rendering it extremely toxic and producing the white precipitate. On each occasion I had the precipitated solutions analysed, to try to ascertain the nature of the decomposition which had taken place. On the first occasion the strength was ascertained to be 1.98 per cent., showing that no concentration of the solution had taken place, while no chemical change could be detected. On the second occasion I sent part of the solution to another expert chemist, but he also did not find any chemical decomposition of the drug. I also made cultures from one and isolated a sporing bacillus, which must have gained access during the use of the solutions, but on adding cultures of it to fresh solutions of tartar emetic no precipitate was produced even after standing for nearly a month. The remaining patient of the second series recovered after a subcutaneous saline injection, and he also had no more fever, gained weight rapidly, and was in due course discharged cured.

In view of the remarkably rapid and complete recoveries of the three patients who survived the critical reactions, I had hoped to have found some chemical change in the solution, which might under properly controlled conditions prove of practical value, but this hope has not been fulfilled. The very high febrile reactions, followed by immediate and permanent cessation of the fever in each of the three surviving cases, indicate a toxæmia due to destruction of large numbers of the parasites, but why the precipitated solutions should be so toxic both to the parasites and the patients remains a mystery. As tartar emetic is sufficiently soluble to allow of a 6 per cent. strength being made, the precipitation of the 2 per cent. solution after some weeks in a flask points to chemical decomposition of some kind. Similar

solutions made at the same times from the same samples of the chemical have been simultaneously in use in my own ward during over two years without any such accidents having taken place, so that if the rule of never using any solution which is not absolutely clear is enforced they are preventable, while it will clearly be advisable in future to use only solutions prepared within two weeks, unless sealed in glass bulbs, which are difficult to obtain during the war. It is only right to mention that the hospital in which the accidents took place is much understaffed, while the subordinates have been frequently changed on account of war conditions. As I am largely responsible for the use of full doses of tartar emetic in Indian kala-azar and for making the solutions which decomposed, I desire to place the above accidents on record without reserve, together with the following trials of sodium antimonyl tartrate in kala-azar, which I have made to ascertain if it is superior to tartar emetic in safety and equally efficient in its action.

## II. SODIUM ANTIMONYL TARTRATE IN KALA-AZAR.

In 1908 R. H. Aders Plimmer(2) prepared sodium antimonyl tartrate (which he states was described in 1842 by Dumas and Piria) and in conjunction with J. D. Thomson(3) recorded remarkable effects of the chemical on trypanosomes in the blood of rats. Martindale states that the drug is less toxic than tartar emetic, and I have confirmed this statement in the case of intravenous injections in pigeons and rabbits, although the difference is not very great. As already mentioned the drug has been used in isolated cases of kala-azar at the Campbell Hospital in Calcutta by Dr. H. N. Ghosh in combination with berberine, etc., and by Dr. U. N. Bramachari. In view, however, of the greater toxicity of tartar emetic and the liability of solution of that drug when not sealed in capsules but exposed to the air in flasks to undergo dangerous decomposition, as recorded in the first part of this paper, it was clearly advisable to test the sodium salt by itself on a larger scale in a series of cases in such a manner as to be strictly comparable with a previous series treated with tartar emetic. I have therefore used the sodium salt exclusively in a similar manner and dosage to my former trials of tartar emetic in the same ward of the Medical College Hospital, where my medical colleagues have very kindly continued to grant me facilities for my researches on kala-azar.

The main features of the series are shown in Table I, constructed on similar lines to that of the earlier tartar emetic series(1), except that the blood counts are omitted from the present series as I had not time to make them myself. The figures obtained by my house physicians, however, were very similar to those I obtained

in the tartar emetic cases. The cessation of the fever, gain in weight, and diminution of the size of spleen, shown in the tables, suffice to clearly indicate the results obtained by the two drugs respectively.

*The relative toxicity of sodium antimonyl tartrate and tartar emetic.*—Before discussing the table of cases it will be convenient to note my clinical impressions regarding the toxicity of the two drugs derived from these trials. I have already recorded that the toxic symptoms of tartar emetic first show themselves by coughing immediately following the intravenous injection, and nausea or actual sickness a little later, while large and dangerous doses occasionally produce within a very few hours feeble pulse or even collapse and rapid deep respirations and high fever sometimes amounting to hyperpyrexia; cough, nausea and sickness have been much less evident after equivalent doses of the sodium salt, while with doses up to  $6\frac{1}{2}$  c.c. of the 2 per cent. solutions in emaciated Indian patients no case of anything like collapse has occurred although some 40 injections have now been given. Sodium antimonyl tartrate is nevertheless a very powerful remedy, and should be used with the same precautions as regards gradual increase of the doses in relation to body weight as I have already advised for tartar emetic solutions(1).

The local irritant effect is also decidedly less with the sodium than with the potassium salt, as originally noted by Plimmer and Thomson. The escape of a few drops of tartar emetic around a vein produces a large and very painful swelling usually followed by the eventual discharge of a few drops of sterile pus, leading to loss of time due to temporary cessation of injections and obstruction of useful veins. With the sodium salt, pain and swelling are much less, and I have not yet seen suppuration follow this accident.

Sodium antimonyl tartrate has, then, decided advantages over tartar emetic in being less toxic both generally and locally.

*The relative efficiency of sodium antimonyl tartrate and tartar emetic in the treatment of kala-azar.*—For ascertaining this, the data in Table I of this paper should be compared with those of Table II on page 244 of the 1917 volume of this journal. The results in the two series of cases will be found to correspond very closely. For convenience of comparison we may compare the average figures of the principal data of the cases which remained long enough in hospital to fully test the treatment, namely, the eight cases discharged cured after the tartar emetic treatment and the nine cases cured with sodium antimonyl tartrate. In both series all the cases were verified by finding the kala-azar parasites by spleen puncture. These data are shown in a simple form in Table II.



The best tests of the efficiency of the drugs are—firstly, the average time required to bring about a cessation of the fever apart from the temporary reactionary rises of temperature immediately following an injection; and, secondly, the total amount in centigrammes of the drug which brought about this all-important improvement. The data in Table II show that the average time required to stop the fever was 21·2 days with

generally and locally. This conclusion is in accordance with the clinical impressions I had formed from watching the cases day by day, namely, that the sodium salt gives more uniformly satisfactory results with much less anxiety regarding the possibility of untoward results, and I have now completely given up using tartar emetic in favour of sodium antimonyl tartrate. I am now taking advantage of the lesser toxicity of the

TABLE I.  
*Sodium Antimonyl in Indian patients in the Medical College Hospital.*

| Number of case. | Age. | Duration in months. | Days in hospital. | Days of fever. | Centigrammes of drug to cessation of fever. | Total in centigrammes. | Maximum dose in c.c. of 2 per cent. solution. | Spleen below ribs in inches. | Diminution in spleen in inches. | Weight in lb. on admissions. | Gain in weight in lb. | Parasite in spleen blood. | Complications.   | Result of treatment. |
|-----------------|------|---------------------|-------------------|----------------|---|------------------------|---|------------------------------|---------------------------------|------------------------------|-----------------------|---------------------------|--|----------------------|
| 1               | 19   | 8                   | 59                | 16             | 50  | 156                    | 5½  | 5½                           | -1                              | 92½                          | 4                     | +                         | .....  | Cured.               |
| 2               | 24   | 3                   | 103               | 32             | 90  | 234                    | 6½  | 4                            | -2½                             | 102½                         | 8                     | ++                        | .....  | Do.                  |
| 3               | 20   | 6                   | 60                | 30             | 98  | 142                    | 5½  | 5                            | -3½                             | 91                           | 4                     | ++                        | .....  | Do.                  |
| 4               | 24   | 12                  | 135               | 30             | 85  | 236                    | 6½  | 6½                           | -4                              | 108½                         | 10½                   | ++                        | .....  | Do.                  |
| 5               | 13   | 2                   | 57                | 21             | 38  | 96                     | 3½  | 4                            | -2                              | 56½                          | 10                    | ++                        | .....  | Do.                  |
| 6               | 21   | 9                   | 66                | 12             | 14  | 66                     | 6   | 5½                           | -4½                             | 95                           | 3                     | ++                        | .....  | Do.                  |
| 7               | 25   | 7                   | 41                | 6              | 12  | 113                    | 5½  | 6                            | -1                              | 79                           | 0                     | ++                        | .....  | Do.                  |
| 8               | 45   | 12                  | 82                | 24             | 28  | 216                    | 6¼  | 3½                           | -1                              | 90½                          | 15                    | ++                        | .....  | Do.                  |
| 9               | 20   | 6                   | 54                | 20             | 69  | 153                    | 6   | 3                            | -1                              | 83½                          | 8½                    | +                         | .....  | Do.                  |
| 10              | 21   | 1                   | 78                | ...            | ...   | 82                     | 5½  | 4½                           | -1                              | 77                           | 1½                    | +                         | Dysentery and can-<br>crum oris.<br>Broncho-<br>pneumonia. | Improved.            |
| 11              | 24   | 7                   | 67                | 29             | 56  | 114                    | 5½  | 3½                           | -3                              | 98½                          | -6½                   | +                         |  | Do.                  |

the sodium salt against 26·2 days in the tartar emetic one, while the total quantity averaged 54 centigrammes of the sodium antimonyl tartrate as compared with 103 centigrammes. of tartar emetic. After allowing for accidental variations in a small series of cases, there is still a definite margin of superiority in favour of the sodium salt. The average maximum dose in the two series only varied between 5·7 and 5·9 c.c. of the 2 per cent. solution. The next most important data are the average reduction in the size of the spleen in inches and the average gain in body-weight, the figures for which are closely approximate in the two series. The remaining data, namely, the number of days in hospital and the total amount of the drug given before discharge, depend on such accidental circumstances as the degree of debility on admission and the residence of the patients, as those living near the hospital were discharged earlier and attended as out-patients. The somewhat longer average stay of the sodium salt series was largely due to one man living far from Calcutta being kept in for 135 days. After allowance for this, the figures are approximately the same.

The foregoing analysis shows that sodium antimonyl tartrate is at least as effective, and probably rather more so, than the tartar emetic, while it is certainly safer and less toxic both

sodium antimonyl tartrate to give the injections every other day, so far with even more rapid improvement than that recorded above. As in the case of tartar emetic, the injections must be continued for about two months after the fever is controlled to prevent relapses due to some of the parasites escaping destruction. Nevertheless, tartar emetic in careful hands can give excellent results in kala-azar as shown by the several series of cases I have previously recorded and by the great success of my friend Dr. E. Muir(4) of the Kalna Mission Hospital in the Burdwan district.

TABLE II.  
*Comparison of the average data of two series of cases of Kala-azar treated respectively with Sodium Antimonyl Tartrate and Tartar Emetic.*

|   | Sodium Antimonyl Tartrate. | Tartar Emetic. |
|---|----------------------------|----------------|
| Days in hospital ...                                | 73·6 days                  | 62·4 days.     |
| Days fever under treatment ...                      | 21·2 "                     | 26·2 "         |
| Centigrammes of drug to ces-<br>sation of fever ... | 54 cgms.                   | 103 cgms.      |
| Total drug in centigrammes ...                      | 160                        | 155            |
| Decrease of spleen in inches ...                    | 2·2 inches                 | 2·5 inches.    |
| Increase in weight in lb. ...                       | 8 lb.                      | 7 lb.          |
| Maximum dose of 2 per cent.<br>solution ...         | ·7 c.c.                    | 5·9 c.c.       |

In view of the technical training and experience required to enable long series of intravenous injections to be given in kala-azar, it is still much to be desired that a simple and effective method of treating the disease by some form of hypodermic or intramuscular injection should be worked out. I have already reported that antimony oxide subcutaneously failed in my hands in kala-azar, but further research is required in this direction.

REFERENCES—(1) *Indian Medical Gazette*, 1917, pp. 241 and 265. (2) Reports of Sleeping Sickness Commission of the Royal Society, IX, p. 117. (3) *Ibid*, p. 107. (4) *Indian Medical Gazette*, 1917, p. 317.

### RAT DESTRUCTION AS A MEANS FOR THE PREVENTION OF PLAGUE.

By G. W. P. DENNY, C.I.E.,  
COLONEL, I.M.S. (Retd.)

In the January number of the *Indian Medical Gazette* I published an article, in which I endeavoured to show, in general terms, that the destruction of rats, even on a thoroughly systematic scale, was useless as a measure for the prevention of plague in Indian towns. With apologies to those who are not of my way of thinking on this question, I venture now to publish, at the special bidding of some of my friends, and for the information of the advocates of rat campaigns, some further facts regarding this measure, which I have obtained from the Sanitary Commissioner's Office in the Central Provinces, through the courtesy of the Hon'ble Colonel W. Robinson, C.B., I.M.S., late Inspector-General of Civil Hospitals in the Central Provinces. The statement shows the number of plague-deaths, the date of commencement and ending of each epidemic, the measures taken, the number of rats known to have been destroyed, the dates on which the rat campaigns were commenced and ended, in each of the municipal towns and in two of the cantonments during the period of seven years, 1910 to 1916.

Few people care to take the trouble of wading through long lists of figures and working out deductions for themselves; so I will endeavour to point out the leading conclusions that these figures indicate, taking each area in turn, without inflicting my readers with the detailed statement itself. I shall be glad to supply a copy of this statement to anyone who would care to study it.

It is necessary before going further to emphasise the fact that the two years 1913 and 1914 were, for some reason not yet definitely explained, singularly exempt from plague in the vast majority of these 43 urban areas, the exceptions in 1913 being the towns of Umrer,

Bhandara, and Pauni, and in 1914 the towns of Nagpur, Saugor, and Hoshangabad.

Every one of the 43 areas, with the exception of Dhamtari (population 10,460) and Drug (population 7,948), had previously been plague-infected. We may assume, therefore, that 41 of the 43 areas must have had in them a certain number of chronic pestis-carrying rats, only waiting for a favourable flea-season for the opportunity of starting another plague epizootic followed by an epidemic. Dhamtari is said to have never had a single indigenous or even an imported case of plague during these seven years, and has never at any time carried out rat destruction, while Drug, on the other hand, during the seven years has systematically carried out rat destruction and has had three imported cases though no indigenous plague. But it may be conjectured from the actual number of rats destroyed annually (about 2,000) that this could only represent a small fraction of the rats that exist in the town. Of the 43 areas on my list, Drug and Buldana are the only two in which the destruction of rats in any way tends to show that this measure may have saved the towns from plague outbreaks by reducing to some extent the normal rat population. On the other hand, it is difficult to believe that a comparatively large town like Dhamtari, with a population of 10,469, surrounded as it has been on all sides by plague-infected towns and villages, could never have had during these seven years a single case of human plague imported into it, or a single plague-infected rat introduced into it. Its exemption, then, can only be accounted for, in my opinion, by the facts that it either had no rats or that its rats harboured no fleas. The latter seems much the more probable.

It is necessary to mention also that the measures adopted in many of these towns for the destruction of rats include, besides trapping, the systematic smoking out of their holes by the so-called "Nim Butti" used in the Punjab, and also the use of various rat poisons. The two latter methods, of course, can give one no accurate idea of the number of rats destroyed. So the figures showing the number of rats destroyed probably represent only a small fraction of the actuals. I think we may safely estimate that in a town where trapping, smoking, and poisoning were systematically carried out, the rats destroyed were quite double the figures shown in my statement.

Now I will analyse the figures of each area in the statement.

1. Nagpur.—Population, 1,34,008. 1910—Plague-deaths, 286. Prevailed in spring and in the autumn. No rat destruction. 1911—Plague-deaths, 1916—Prevailed in spring and broke out again at close of the year. Rat destruction carried out very systematically in May and June and again in October, November and December 32,000 rats known to be destroyed.

1912. Plague continued from 1st January, 1912, to 10th May, 1912. Rats systematically destroyed during first three months and from June to December. Total rats destroyed 21,168, 1913—Only four cases of plague in whole year. Rat campaign continued systematically, January to March and June to December. Total rats known to be destroyed, 45,488. 1914—Plague broke out in November and accounted for 133 deaths, i.e., it broke out eleven months after cessation of three years of wholesale rat destruction. The destruction of rats was stopped on 31st December, 1913. 1915—Plague continued from 1st January, 1915, to 12th March, 1915; 5,070 deaths. No rat campaign. 1916—Plague started in January and continued till end of April, recommenced in July and continued till close of the year.

Rat campaigns very vigorously carried out in 1911, 1912, and 1913 (98,656 rats known to have been destroyed during these three years); stopped in 1914 and plague commenced again eleven months later. But the years 1913 and 1914 were singularly free from plague throughout the province, so rat campaigns in Nagpur in 1911, 1912, and 1913 cannot have been the cause of this freedom from the disease. Moreover the vigorous campaign of 1911 (32,000 rats) did not prevent violent outbreak of plague in December of that year which continued till May 1912. Nor did destruction of 45,588 rats in 1913 prevent plague-breaking out eleven months later and continuing well into 1915.

2. *Kamptee*.—Cantonments and town. Population, 23,992. Nine miles from Nagpur by train and by road.

Rise and fall of plague corresponds with those at Nagpur. No case in 1913 or 1914. No rat campaigns conducted.

3. *Ramtek*.—Population, 8,233. Small town, 25 miles from Nagpur by rail and by road. 1910—Severe plague in autumn of 1909, lasting till March 1910. Rat campaign carried out throughout the year. 1911—No indigenous plague. Rat campaign carried out vigorously throughout the year (3,747 rats). 1912—Plague broke out on 20th February, 1912, and continued till 12th April, 1912 (50 deaths). Rat campaign continued (1,472 rats).

1913—No plague. Rat campaign ceased on 4th March, 1913.

1915—Plague commenced in January and continued till April. No rat campaign. 1916—Plague commenced in January, and lasted till March, recommenced in August and lasted till close of the year. No rat campaign.

In this town plague was at its worst in spring of 1912, after a most vigorous rat campaign throughout 1911, and was bad again in spring and autumn of 1916, i.e., two years after cessation of rat campaign.

4. *Kapa*.—Population, 8,233. Small town, 20 miles from Nagpur by road. 1910—Plague prevailed (27 deaths). Rat destruction on very small scale. 1911—Plague severe in the autumn. Rats steadily destroyed during whole year. 1912—Plague continued from previous autumn till middle of March, and caused 161 deaths this year. Rat destruction stopped. 1913—No plague. No rat destruction. 1914—No plague. No rat destruction. 1915—Plague broke out on 6th January and continued till 20th May, 1912. No rat destruction. 1916—No plague in spring but broke out again on 5th October, 1916, and continued till close of the year. No rat destruction.

5. *Unrer*.—Population, 17,630. Twenty-five miles from Nagpur by rail. Plague severe in autumn of 1910, almost absent in 1911 and 1912; severe in spring of 1913, severe in winter of 1915 and in autumn of 1916. Rat campaigns carried out every year but most vigorously in 1912, and this was followed in spring of 1913 by severe epidemic. Rat campaign slack in 1913 (640 rats) followed by practically no plague during next twelve months. Rat campaign very slack in 1910, and practically no plague during next twelve months.

At this town, unlike most others in the province, plague was severe in 1913. This was the year following their most vigorous rat campaign.

6. *Bhandara*.—Population, 13,728. On main line, few hours' journey from Nagpur. Plague occurred every year except in 1914. Unlike most other towns in the province, it was rather severe in 1913. Rat campaigns carried out somewhat erratically. 1,219 rats destroyed in 1914, and this was followed in the following spring by a somewhat severe epidemic.

7. *Panni*.—Population, 10,222. Small town, 35 miles from Nagpur by road. Indigenous plague every year except 1911 and 1914. Rather bad in 1913, when most other towns were exempt. No rat campaigns carried out.

8. *Wardha*.—Population, 12,540. Few hours' journey on main line from Nagpur. Plague prevailed every year except 1913 and 1914. Rat campaigns carried out very erratically but most vigorously throughout 1911. This was followed in spring of 1912 by severe epidemic. Only 221 rats destroyed in 1912 and this was followed by two years of complete exemption from plague. In 1914 there was no rat campaign and this was followed by severe epidemic in following spring. Only 48 rats destroyed in 1915 and only twelve cases of plague in following year.

9. *Hinganghat*.—Population, 14,943. Short journey on branch line from Wardha. Plague severe in 1910 and 1916, slight in 1911, 1912, and 1915, and entirely absent in 1913 and 1914. Practically no rats destroyed in 1910. This was followed by four years of almost complete exemption.

10. *Arvi*.—Population, 11,902. Fifteen miles from Wardha by road. Practically no plague till autumn of 1915. Severe epidemic in spring of 1916. Rat campaigns vigorously carried out every year. 11,913 rats destroyed in 1914 and 17,825 in 1915, and yet severe plague broke out in autumn of latter year when rat destruction had reached its maximum, after several years of exemption.

11. *Chanda*.—Population, 19,866. Few hours' journey on branch line, from Wardha. Very little plague during the seven years. No rat campaigns of any kind carried out during the period.

12. *Balaghat*.—Population, 7,400. Small town, on branch line, between Jubbulpore and Gondia. Some plague in 1911, 1912, 1915 and 1916. Other years entirely exempt. No rat campaigns of any kind carried out.

13. *Jubbulpore City*.—Population, 79,009. Plague every year except 1913. Very severe in 1910 and 1912. No rat campaign till autumn of 1914. Vigorously continued during whole of 1915 and 1916, and yet in November of the latter year plague broke out again and accounted for 190 deaths.

14. *Jubbulpore Cantonments*.—Population, 21,642. Plague severe in autumn of 1910 and spring of 1911 and 1912, after which it never recurred again. Rats destroyed on a small scale every year except in 1912. It may be presumed that rats were plentiful during this year, and yet no plague occurred in the following four years.

15. *Marwara*.—Population, 15,812. Small town, 60 miles from Jubbulpore on railway line. Some plague in 1910 and 1913; severe in 1912 and entirely absent in the other four years. No details of rat destruction available.

16. *Saugor*.—Population, 34,876. Almost free of plague from 1910 till autumn of 1914, when severe epidemic occurred, which continued till April 1915. No information regarding rat destruction available during this period. In autumn of 1916 very vigorous rat campaign (21,849 rats destroyed). No plague in that year, but there was none in any of the towns in the north of the Central Provinces either, at which practically no rat destruction was carried out.

17. *Damoh*.—Population, 17,042. Few hours' journey by rail from Saugor. Plague severe in spring of 1912 and in spring of 1915. None in 1910, 1911, 1914, or 1916.

No rat destruction worthy of the name carried out during any year.

18. *Seoni*.—Population, 13,839. Eighty miles on Grand Trunk Road, between Nagpur and Jubbulpore. Plague severe in 1912. Entirely absent in 1910, 1911, 1913, and 1914. Vigorous rat campaign throughout 1910 and 1911, followed in spring of 1912 by severe epidemic.

19. *Mandla*.—Population, 9,379. Small town, few hours' journey on branch line from Jubbulpore. Plague severe in 1911. Almost absent during the other six years. No rat destruction worthy of the name.

20. *Hoshangabad*.—Population, 12,099. Fifteen miles by rail from Itarsi. Plague severe in 1911 and 1914. Other five years exempt. No rat destruction worth mentioning till 1916.

21. *Harda*.—Population, 15,558. On main line, few hours' journey from Hoshangabad. Plague epidemics in 1910, 1911, and 1915. No plague in 1912, 1913, and 1914. Rat destruction in 1910, followed by severe epidemic in 1911. Rat destruction carried on in 1913, 1914, and 1915, most vigorously in latter year (14,371 rats) followed by no epidemic next year, but the two neighbouring towns of Hoshangabad and Khandwa, where no rats were destroyed in 1915, were also practically exempt from plague in 1916.

22. *Khandwa*.—Population, 21,604. On main line, few hours' journey from Harda. Severe plague in autumn of 1911 (649 death); exempt in 1912, 1913 and 1914; very little in other three years. Very feeble rat campaign in 1911 (1,546 rats) followed by four years of almost complete exemption from plague, though no further rat destruction was carried out till 1916.

23. *Burhanpur*.—Population, 30,435. On the main line and close to Khandwa. Severe plague in spring of 1911, while Khandwa remained free; and Khandwa was attacked severely in autumn of 1911 while Burhanpur remained free. Another severe epidemic in spring of 1912, followed by three almost exempt years, and then, in 1916, very severe plague prevailed, which continued most of the year, while Khandwa remained almost free. Rat destruction very feebly carried out during five of the seven years. Largest number of rats destroyed in 1911 (1,584) followed by severe epidemic in spring of following year. Only 102 rats destroyed in 1912, followed by two completely exempt years.

24. *Narsinghpur*.—Population, 10,630. Close to Jubbulpore on main line. Plague epidemics in 1910, 1911, and 1912, corresponding with those at Jubbulpore, followed by complete exemption during next four years. No rat destruction worth mentioning carried out.

25. *Badnur*.—Population, 7,454. Small isolated town in interior of Satpura range of hills, off the railway line till quite recently. Some plague in 1911 and 1914; severe in 1912, and completely absent during the other four years. No rat destruction attempted till 1916.

26. *Chhindwara*.—Population, 12,872. Small town on elevated plateau communicating with Nagpur and Seoni by railway lines. Mild epidemics in 1910 and 1915; very severe in autumn of 1911, in spring of 1912 and again in spring and autumn of 1916. Completely absent in 1913 and 1914. No rat destruction attempted till autumn of 1915, and continued throughout 1916, but in spite of this plague was severe in both spring and autumn of 1916.

27. *Raipur*.—Population, 35,335. Large town on main line to east of Nagpur. No indigenous plague till spring of 1912, followed by three and a half exempt years, and then a mild epidemic in autumn of 1916. No systematic rat destruction at any time.

28. *Dhamtari*.—Population, 10,460. Small town in south of province, about 35 miles, on branch line, from Raipur, and about same distance by road from Drug. Complete exemption from plague during the seven years. No rat destruction of any kind during this period.

29. *Bilaspur*.—Population, 19,850. On main line north-east of Raipur. Mild epidemic in 1912, complete exemption in 1910, 1911, 1913, 1914, and 1915. Severe

epidemic in winter of 1916. Rat destruction feebly carried out in 1910 and 1912, and nothing worth mentioning during any of the other years.

30. *Drug*.—Population, 7,048. Small town on main line between Nagpur and Raipur. Completely free from indigenous plague during the seven years. Rat destruction feebly carried out during the whole period (only an average of about 2,000 rats destroyed annually).

31. *Amraoti City*.—Population, 34,270. Large town on main line, between Nagpur and Bhusaval. Severe epidemic in 1910, slight in 1911, very mild in 1912. Completely free from plague in 1913 and 1914, followed in autumn of 1915 by severe outbreak and a mild one in 1916. No rat destruction carried out at any time.

32. *Amraoti Camp*.—Population, 6,340. Small town, about two miles from above. Plague in 1910 and 1911, complete exemption in 1912, 1913, and 1914, followed by epidemic again in 1915 and spring and autumn of 1916. Some rat destruction carried out during 1910 and beginning of 1911 and again in autumn of 1915, but number of rats destroyed is not available. The campaign of 1910-11 was followed by four years of exemption from plague but the campaign of autumn of 1915 was followed by plague in spring and autumn of the next year.

33. *Ellichpur City*.—Population, 24,435. About 40 miles by road to north of Amraoti. Severe epidemic in autumn of 1910 and spring of 1911, followed by three and a half completely exempt years, and then severe epidemic again in autumn of 1915 and spring of 1916. Some rat destruction carried out in winter of 1910 and spring of 1911 (figures not available). None in 1912, 1913, and 1914. Again on feeble scale in autumn of 1915.

34. *Ellichpur Camp*.—Population, 6,962. Small town close to above. Plague very severe in winter of 1910 and spring of 1911; somewhat so in winters of 1915 and 1916. Complete exemption in 1912, 1913, and 1914. Rat destruction said to be carried out every year but no figures available. Probably only on a feeble scale.

35. *Yeotmal*.—Population, 13,525. About 30 miles off the main line, to the south-west of Wardha. Severe plague in autumn of 1910, complete exemption during next five years. Severe outbreak occurred again in autumn of 1915 and spring of 1916. No rat destruction till autumn of 1915 and then only on very feeble scale.

36. *Akola*.—Population, 27,183. Large town, on main line, between Nagpur and Bhusaval. Plague epidemics in 1910, 1911, 1915, and 1916, with complete exemption in 1913 and 1914, corresponding almost exactly with those in the neighbouring town of Amraoti. Rat destruction in last half of 1911 and first half of 1912 (1951 rats) followed by complete plague exemption in 1912, 1913 and 1914. But same exemption occurred at the neighbouring town of Amraoti and other towns, where no rat destruction was carried out. No rat destruction in 1913 and 1914, followed in spring and autumn of 1915 and also in 1916 by severe epidemics. But plague prevailed severely during 1915 and 1916 in almost every town in this part of the province, in many of which vigorous rat campaigns had been systematically carried out during several preceding years, so the want of rat campaigns at Akola cannot be said to account for the outbreaks of 1915 and 1916.

37. *Akoti*.—Population, 14,830. About 20 miles north of Akola by road. Plague epidemics in 1910, 1911, 1915, and 1916, corresponding with those in most towns in this part of the province, with complete exemption in 1912, 1913, and 1914. Rat destruction carried out for six consecutive years but not on a large scale (about 2,000 rats annually) and abandoned in 1916.

38. *Kanarja*.—Population, 12,852. About 20 miles off the main line, to the south-west of Amraoti. Plague epidemics and exemptions same as above, vigorous rat campaigns throughout 1910, followed next spring by severe epidemic. Very vigorous campaigns in 1913 and 1914 (22,311 rats) followed, ten months later, by severe



epidemic, which lasted five months. Rat campaigns were then abandoned.

39. *Basim*.—Population, 11,217. Very remote town. in the south of the province, about 50 miles by road from Akola. Moderate plague epidemic in spring of 1911, followed by five years' exemption and then another severe epidemic. Rat destruction carried out somewhat vigorously from 1910 to 1915. At the end of six years' plague broke out severely again.

40. *Buldana*.—Population, 3,820. Small town, on elevated plateau, in the south of the province about 35 miles off the railway line. Plague epidemic in autumn of 1910, extending to spring of 1911, after which complete exemption for five and a half years. Rat destruction very thoroughly carried out during the whole seven years by means of traps, poison, and "Nim Buttis" under the superintendence of the late Captain Morrison, Chief Plague Medical Officer, who was a strong advocate of this measure. Two imported cases of plague in 1915 and two in 1916 did not cause fresh epidemic. But same can be said of many other towns at which no rat destruction was carried out. Imported human cases of plague do not necessarily bring rat-fleas with them, and even if they do, the disease will not spread if rats in the neighbourhood harbour no fleas. Rat destruction in this town might be said to support this measure as a preventive for plague but for the unfortunate experience gained at the next two towns on the list, *viz.*, Khamgaon and Shegaon, in both of which Captain Morrison took much interest.

41. *Khamgaon*.—Population, 13,171. Few miles distant from the main railway line and connected to it by a branch line. Severe plague epidemics in spring and winter of 1910 and in spring of 1911. Rat destruction was carried out during these two years, but figures not available. Complete exemption from plague in 1912, 1913, and 1914. During these three years very systematic rat campaigns were carried out by Captain Morrison and 21,191 rats were known to be destroyed. But in January 1915, plague broke out and recurred in the autumn. During this year, 43,809 rats were known to have been destroyed, besides vast numbers that were poisoned or suffocated, and yet plague continued very severely all through the spring of 1916; broke out again severely in the autumn of that year and continued till February 1917. During 1916, 11,832 more rats were known to have been destroyed. This is the town in the Central Provinces in which rat destruction was most vigorously and systematically carried out, largely due to the co-operation of the people and the interest that Captain Morrison took in the measure. And yet at the end of six years of continuous rat campaigns plague broke out in the seventh year and accounted for 290 deaths in a comparatively small town. The total number of rats known to have been destroyed during the period 1912 to 1916 was 76,832, and if we allow for those killed by poison and suffocation, we may safely put the actual number of rats destroyed in the five years at 150,000. The labour and cost of these campaigns was enormous, and they resulted in Khamgaon being visited at the end of the five years by the severest epidemic it experienced during the seven years.

42. *Shegaon*.—Population, 11,962. Small town, on main line, between Nagpur and Akola. Severe plague epidemic in spring and autumn of 1910 extending into late spring of 1911. Rats destroyed in 1910 (17,788) and yet in spring of 1911 plague accounted for 288 human deaths out of 420 cases. Then came three and a half years' complete exemption from the disease with also a slackening off in the rat campaigns. In 1915, 14,728 were known to have been destroyed and yet in September of that year plague broke out again and in three months accounted for 560 cases with 163 deaths. The epidemic continued till March 1916 and broke out again in December 1916, and accounted for 220 more deaths. In this small town rats had been destroyed steadily during the seven years, the most

vigorous campaigns being conducted in 1910 and 1915 and yet it was the two years following these, *viz.*, 1911 and 1916, that had the worst epidemics. The total rats known to have been destroyed in the seven years was 33,904, so we may safely estimate that the actual number of these rodents killed was not less than 75,000. And what benefit did Shegaon get for it? Can anyone believe that the rat population in the town at the end of the seven-year campaign was appreciably below the normal? If so, why has plague decimated the town at the end of the seven-year campaign?

43. *Malkapur*.—Population, 13,906. Small town, on main line, between Akola and Bhusaval. Severe plague epidemic in spring and autumn of 1910 and in spring of 1911. Again in spring and autumn of 1916, with an interval of four years of complete exemption. Rise and fall of the disease correspond with those of all other towns in that part of the Province. Rats were destroyed in a half-hearted way during the period 1910 to 1914. Vigorous campaign in 1915 and continued all through 1916 (15,294 rats). Severe epidemic in spring of 1916, recurring again next autumn. What then can Malkapur be said to have gained by the destruction of over 15,000 rats during 1915 and 1916?

I venture to think these figures ought to convince the most ardent rat campaigners that the destruction of rats, even when carried out on a most systematic and gigantic scale with the entire co-operation of the people, cannot save an Indian town from plague epidemic, if other circumstances be favourable. For some reason yet to be explained, certain towns in the C. P. seem to have been proof against plague during these seven years, as instanced by Dhamtari and Drug. At the former no rats were destroyed, and at the latter they were systematically killed, but on a small scale. Buldana might be instanced as a case in support of rat destruction, but the same cause that kept Dhamtari free might have been operating here. On the other hand, the most striking failures of rat destruction are instanced at the towns of Khamgaon, Shegaon, and Malkapur, all of which are in the same part of the province as Buldana, but on the railway line, while Buldana is not.

In conclusion, then, I would point out that not only do these figures show rat destruction to be useless as a means for the prevention of plague outbreaks, but in several of the towns referred to there is strong reason for thinking that the attempt to reduce the normal rat population of a town has tended to increase the chance of that town becoming plague-infected. They also seem to show that towns previously plague-infected at which no rat destruction was attempted are not more prone to a recrudescence of the disease than those in which vigorous and systematic rat campaigns were conducted.

We come back then to the question raised in my article published in the January number of the *Indian Medical Gazette*, namely, whether experience justifies the large expenditure of money and labour that rat campaigns involve and whether the money so spent might not be more profitably utilised?



Some of my readers may say that my article amounts nearly to destructive criticism, and that I put forward no alternative suggestions for fighting this terrible scourge. I plead guilty to the impeachment. But I am in hopes that those who are now in a position to do so may be able to devise some method whereby we shall eventually be able to control or check the unlimited multiplication of the rat flea, or considerably reduce the number that each rat is able to harbour. The suggestion put forward by the Civil Surgeon, Karnal, for the use of tobacco in some form with this object in view seems well worth experimentation. All I wish to show in this article is that money spent on rat destruction is money wasted.

### THE HÆMOGLOBIN INDEX AND OTHER FACTORS IN NEWLY RECRUITED COOLIES TO THE F. M. S.

By M. J. RATTRAY, M.R.C.S., L.R.C.P.

THE returns presented hereunder are those taken from the examination of Indians and Chinese coolies newly arrived from their native coasts on a Rubber Estate in Johore. Absolute accuracy in the examination of stools could not be obtained owing to difficulties in the direction of discontent and distrust likely to be incurred by too drastic handling of newly arrived labourers. Two smears were taken from each person and were very carefully examined. The figures

returned from these are high enough to afford a fair idea of what the actual results would have been had it been practicable to purge the coolies after suitable starvation. The records of only three forms of helminthiasis are given, although other forms were noted.

The hæmoglobin indices were estimated by Tallquist's hæmoglobinometer.

I am indebted to Hospital Assistant P. Samy for his ready and tactful help, without which these records would not have been possible. I am also indebted to the Manager of the Estate who granted me permission to make such use of the coolies as was deemed advisable.

The Indians were mixed gangs of Tamils.

#### *The Helminthiasis of Newly Arrived Coolies.*

Examinations were made for—

Ankylostomiasis.

Ascaris.

Trichuriasis.

The conditions are shown as occurring singly and in combinations: and for simplicity are classified under the letters as shown:—

|                 |     |   |
|-----------------|-----|---|
| Ankylostomiasis | ... | A |
| Ascariasis      | ... | B |
| Trichuriasis    | ... | C |
| Negative        | ... | X |

thus A. C. means Ankylostomiasis and Trichuriasis are present together, B. C. means that Ascariasis and Trichuriasis co-exist in the same individual, etc.

TABLE I.

#### *The Hæmoglobin Index of Newly Arrived Coolies.*

| Series.                   | Up to 30 per cent. | 30—40 per cent. | 40—50 per cent. | 50—60 per cent. | 60—70 per cent. | 70—80 per cent. | 80—90 per cent. | 90—100 per cent. | Number of coolies examined. |
|---------------------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------------------|
| Indians 1                 | ...                | 2               | 5               | 22              | 27              | 18              | 2               | ...              | 76                          |
| Do. 2                     | ...                | 2               | 3               | 9               | 12              | 7               | 1               | ...              | 34                          |
| Total Indians             | ...                | 4               | 8               | 31              | 39              | 25              | 3               | ...              | 110                         |
| Chinese 1                 | ...                | ...             | 2               | 1               | 14              | 37              | 18              | ...              | 70                          |
| Do. 2                     | ...                | ...             | 2               | 8               | 29              | 28              | 5               | ...              | 72                          |
| Do. 3                     | ...                | 1               | 3               | 17              | 43              | 14              | 1               | ...              | 79                          |
| Total Chinese             | ...                | 1               | 5               | 26              | 86              | 79              | 24              | ...              | 221                         |
| Total both Races          | ...                | 5               | 13              | 57              | 125             | 104             | 27              | ...              | 331                         |
| Percentages of both Races | ...                | 1.51            | 3.93            | 17.22           | 37.76           | 31.42           | 8.16            | ...              | 100.00                      |

TABLE II.

#### *Occurrence of Helminthiasis.*

| Series.       | A.  | A. B. | A. B. C. | A. C. | B. | B. C. | C.  | X.  |
|---------------|-----|-------|----------|-------|----|-------|-----|-----|
| Indians 1     | 5   | 31    | 10       | 7     | 18 | 3     | ... | 2   |
| Do. 2         | 1   | 12    | 7        | 1     | 10 | 3     | ... | ... |
| Total Indians | 6   | 43    | 17       | 8     | 28 | 6     | ... | 2   |
| Chinese 1     | ... | 25    | 4        | 3     | 27 | 6     | 3   | 2   |
| Do. 2         | 1   | 25    | 4        | 5     | 25 | 10    | 2   | ... |
| Do. 3         | 1   | 39    | 11       | 1     | 14 | 11    | ... | 2   |
| Total Chinese | 2   | 89    | 19       | 9     | 66 | 27    | 5   | 4   |

## Number of Examinations :—

|         |     |             |     |
|---------|-----|-------------|-----|
| Indian  | ... | Series 1... | 76  |
| Ditto   | ... | Series 2... | 34  |
|         |     |             | 110 |
| Chinese | ... | Series 1... | 70  |
| Ditto   | ... | Series 2    | 72  |
| Ditto   | ... | Series 3... | 79  |
|         |     |             | 221 |
| Total   | ... |             | 331 |

## Total occurrences :—

|                 | Indians. | Chinese. | Total. |
|-----------------|----------|----------|--------|
| Ankylostomiasis | 74       | 119      | 193    |
| Ascariasis      | 94       | 209      | 303    |
| Trichuriasis    | 31       | 60       | 91     |

## Percentage occurrences :—

|                 | Indians. | Chinese. | Total |
|-----------------|----------|----------|-------|
| Ankylostomiasis | 66.36    | 33.85    | ...   |
| Ascariasis      | 85.46    | 90.50    | ...   |
| Trichuriasis    | 28.18    | 27.14    | ...   |

## Percentage occurrence :—

|                |                 |       |
|----------------|-----------------|-------|
| Both races ... | Ankylostomiasis | 58.31 |
|                | Ascariasis      | 89.12 |
|                | Trichuriasis    | 24.49 |

*The Pigmentation of the Papillæ of the Tongue.*—It has been stated that the pigmentation of the papillæ of the tongue situated at the tip and on the sides opposite the bicuspid teeth, is a phenomenon associated with ankylostomiasis.

The colour of the papillæ ranges from the normal pink through orange and red to a marked brown or black. As previous observation seemed to show that the orange and red colourations were often present in uninfected persons a classification was made in two groups—

- I. Normal to red colour.
- II. Brown or black pigmentation.

Diffuse pigmentation in whole patches of the surface does not appear to be of importance (*vide* Castellani and Chalmers, Manual of Tropical Medicine, 1913, page 1307).

TABLE III.

| SERIES.           | GROUP I.<br>Normal to Red Papillæ. |      |      |      |    |      |     |     |        | GROUP II.<br>Brown or Black Pigmented Papillæ. |      |      |      |     |      |     |     |        |
|-------------------|------------------------------------|------|------|------|----|------|-----|-----|--------|--|------|------|------|-----|------|-----|-----|--------|
|                   | A.                                 | A.B. | ABC. | A.C. | B. | B.C. | C.  | X.  | Total. | A.   | A.B. | ABC. | A.C. | B.  | B.C. | C.  | X.  | Total. |
| Indians 1         | 4                                  | 23   | 6    | 3    | 18 | 2    | ... | 2   | 58     | 1  | 8    | 4    | 4    | ... | 1    | ... | ... | 18     |
| Do. 2             | ...                                | 9    | 4    | 1    | 10 | 2    | ... | ... | 26     | ...  | 4    | 3    | ...  | ... | 1    | ... | ... | 8      |
| Total Indians     | 4                                  | 32   | 10   | 4    | 28 | 4    | ... | 2   | 84     | 1  | 12   | 7    | 4    | ... | 2    | ... | ... | 26     |
| Chinese 1         | ...                                | 18   | 4    | 2    | 26 | 5    | 3   | 2   | 60     | ...  | 7    | ...  | 2    | 1   | ...  | ... | ... | 10     |
| Do. 2             | ...                                | 17   | 1    | 3    | 24 | 10   | 2   | ... | 57     | 1  | 8    | 3    | 2    | 1   | ...  | ... | ... | 15     |
| Do. 3             | ...                                | 26   | 3    | 1    | 13 | 9    | ... | 2   | 54     | 1  | 13   | 8    | ...  | 1   | 2    | ... | ... | 25     |
| Total Chinese     | ...                                | 61   | 8    | 6    | 63 | 24   | 5   | 4   | 171    | 2  | 28   | 11   | 4    | 3   | 2    | ... | ... | 50     |
| Totals both Races | 4                                  | 93   | 18   | 10   | 91 | 28   | 5   | 6   | 255    | 3  | 40   | 18   | 8    | 3   | 4    | ... | ... | 76     |

For both Races.

GROUP I.  
Shows Ankylostomiasis in 49.02 per cent. of cases.GROUP II.  
Shows Ankylostomiasis in 90.78 per cent. of cases.

TABLE IV.

*The Hæmoglobin Index of the Cases showing Pigmented Papillæ.*

| Series.          | Below 30<br>per cent. | 30—40<br>per cent. | 40—50<br>per cent. | 50—60<br>per cent. | 60—70<br>per cent. | 70—80<br>per cent. | 80—90<br>per cent. | 90—100<br>per cent. | Total. |
|------------------|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|--------|
| Indians 1        | ...                   | 2                  | 2                  | 6                  | 5                  | 3                  | ...                | ...                 | 18     |
| Do. 2            | ...                   | ...                | ...                | 4                  | 4                  | ...                | ...                | ...                 | 8      |
| Total Indians    | ...                   | 2                  | 2                  | 10                 | 9                  | 3                  | ...                | ...                 | 26     |
| Chinese 1        | ...                   | ...                | ...                | ...                | 5                  | 5                  | ...                | ...                 | 10     |
| Do. 2            | ...                   | ...                | 1                  | 6                  | 7                  | 1                  | ...                | ...                 | 15     |
| Do. 3            | ...                   | 1                  | 1                  | 9                  | 11                 | 3                  | ...                | ...                 | 25     |
| Total Chinese    | ...                   | 1                  | 2                  | 15                 | 23                 | 9                  | ...                | ...                 | 50     |
| Total both Races | ...                   | 3                  | 4                  | 25                 | 32                 | 12                 | ...                | ...                 | 76     |

The Hæmoglobin Index of the cases *not* showing Pigmentation of the Papillæ : by subtraction from Table I.

|                  |     |   |   |    |    |    |    |     |     |
|------------------|-----|---|---|----|----|----|----|-----|-----|
| Total both Races | ... | 2 | 9 | 32 | 93 | 92 | 27 | ... | 255 |
|------------------|-----|---|---|----|----|----|----|-----|-----|

*The last mentioned returns expressed as percentages.*

GROUP II.—(Cases showing Pigmentation.)

|                |     |      |      |       |       |       |     |     |        |
|----------------|-----|------|------|-------|-------|-------|-----|-----|--------|
| For both Races | ... | 3.93 | 5.26 | 32.86 | 42.08 | 15.87 | ... | ... | 100.00 |
|----------------|-----|------|------|-------|-------|-------|-----|-----|--------|

## GROUP I.—(Cases not showing Pigmentation.)

| Series.        | Below 30 per cent. | 30—40 per cent. | 40—50 per cent. | 50—60 per cent. | 60—70 per cent. | 70—80 per cent. | 80—90 per cent. | 90—100 per cent. | Total. |
|----------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|--------|
| For both Races | ...                | 0.78            | 3.53            | 12.55           | 36.47           | 36.08           | 10.59           | ...              | 100.00 |

## SUMMARY.

1. *Hæmoglobin Index*.—No coolies arrived with a hæmoglobin index over 90 per cent. nor under 30 per cent.

The greatest number in any class were those showing a hæmoglobin index of 60—70 per cent. (37.76 per cent.) Both races favoured this.

2. *Certain forms of Helminthiasis*.—Only 6 individuals out of 331 were not proved to suffer from helminthiasis of one of the forms sought for.

Both races were found to be infected with the three diseases, the percentage returns for each disease not varying widely with each race.

3. *Pigmentation of the Papillæ of the Tongue*.—Pigmentation of the Papillæ of the sides and tip of the tongue is shown to be associated with ankylostomiasis in 90 per cent. of cases in these series.

4. *Anæmia* is a more marked feature in cases showing pigmentation of the tongue than in those which do not show it.

5. For the benefit of the existing forces on Rubber Estates, it is essential that all newly recruited coolies be examined for helminthiasis and treated if found necessary, in order to attempt to check increase of existing infection at the threshold of the Estate.

6. There is sufficient evidence to warrant the routine treatment of every cooly recruited from the Indian and China coasts.

7. Further evidence of coolies presenting anæmia to the degree shown, leads one to believe that it would be wise to reject at the port of emigration all those showing a hæmoglobin index under 60 per cent. and to view with suspicion all coolies so affected as to present the pigmentation of the tongue described.

## NOTES ON THE METALS GOLD, SILVER, AND ARSENIC IN THE COLLOID STATE.

By T. CRAWFORD BOYD, F.R.C.S.I., D.P.H.,

CAPTAIN, I.M.S.

## I. INTRODUCTION.

- (a) Concept of the colloid state.
- (b) Methods of preparation of colloids.
- (c) Detection of colloid state and elementary analysis.

## II. NOTES ON TOXICITY.

- (a) Effects on Red Blood Cells.
- (b) " " " Serum.
- (c) " " " Mucous membranes.
- (d) " " " Subcutaneous tissues.
- (e) " " " Intravenous Injection.

## III. EXPERIMENTS IN VITRO ON PARAMECIUM.

## IV. EXPERIMENTS WITH COBRA VENOM.

## INTRODUCTION.

The concept of the colloid state of matter has undergone many modifications since it was first described by Thomas Graham. To express this state nowadays, we may say that colloids "belong to the group of systems designated as polyphasic." By the term "phase is meant any homogenous part of a system differing from other parts of the system and separated from these by abrupt transitions" (Ostwald). To try and simplify this statement, we may take, for example, a diphasic system such as colloid gold: here we have a disperse phase consisting of a suspension of rigid gold particles varying from 0.1U in diameter to 1UU in size (Zsigmondy), separated by abrupt transitions from the other fluid separating phase, the continuous phase. According to whether the disperse phase is made up of rigid particles, or easily deformable particles, we have the two types of colloids—Suspensoid and Emulsoid, as an example of the latter class, gelatin may be taken.

In this short note it is only the suspensoids—Gold, Silver, and Arsenic—that will be dealt with:

*Methods of Preparation.*

Before proceeding to the actual preparation of the individual colloids, a word of caution is necessary concerning the glassware used; to be satisfactory this ought to be new and prepared carefully as follows:—

- (1) Wash well in hot soap and water.
- (2) Rinse out with tap water.
- (3) Again wash well with dilute nitric acid.
- (4) Get rid of (3) with frequent changes of tap water.
- (5) Finally wash with freshly distilled water.

Unless the above steps are thoroughly carried out, success in the preparation of the colloids will not be attained.

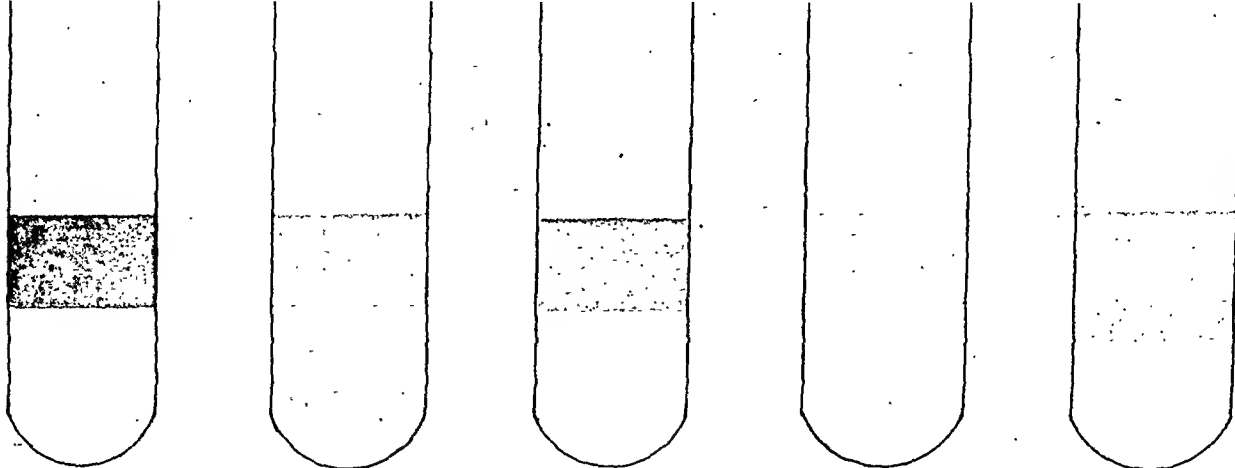


DIAGRAM № I

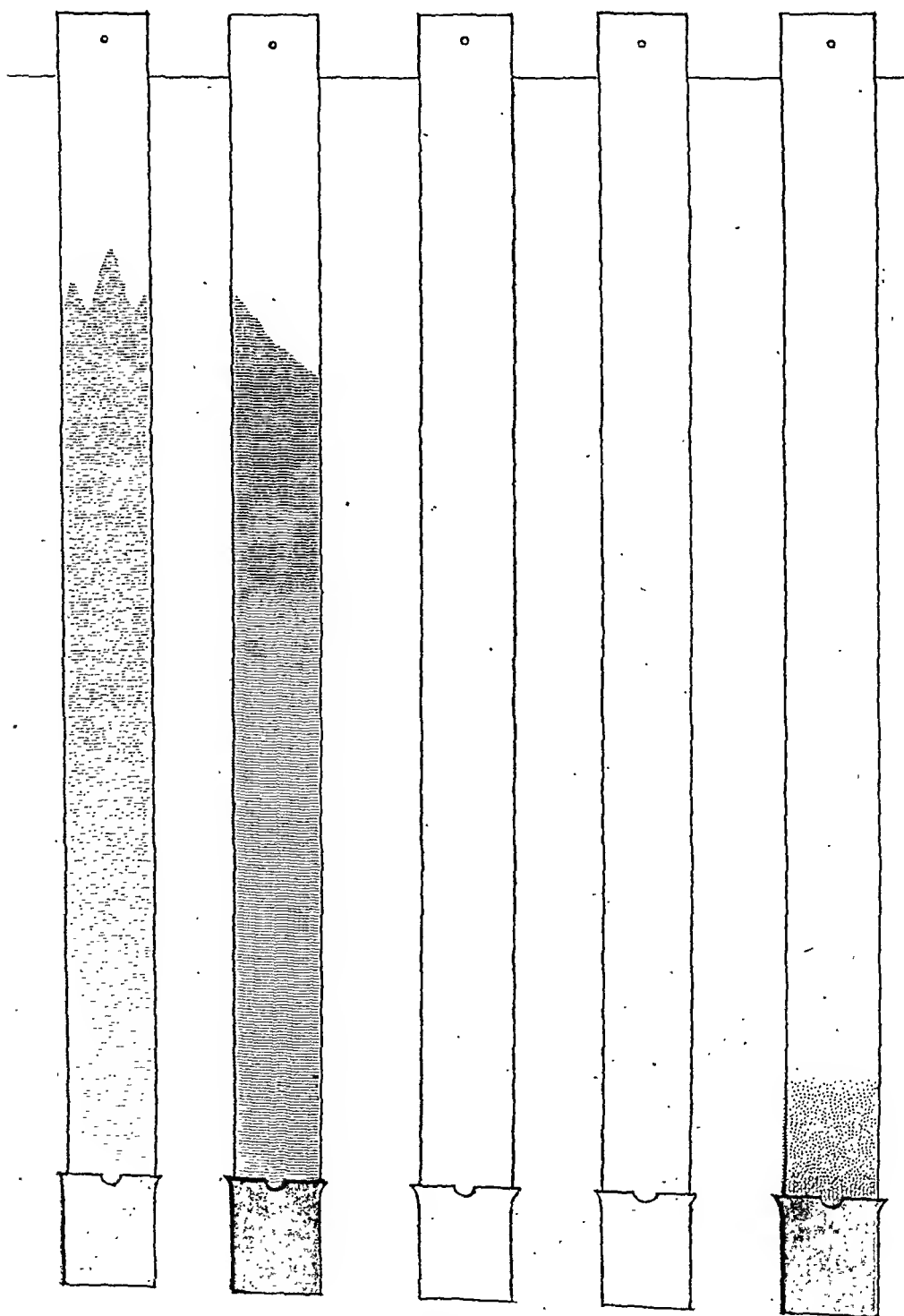


DIAGRAM № II







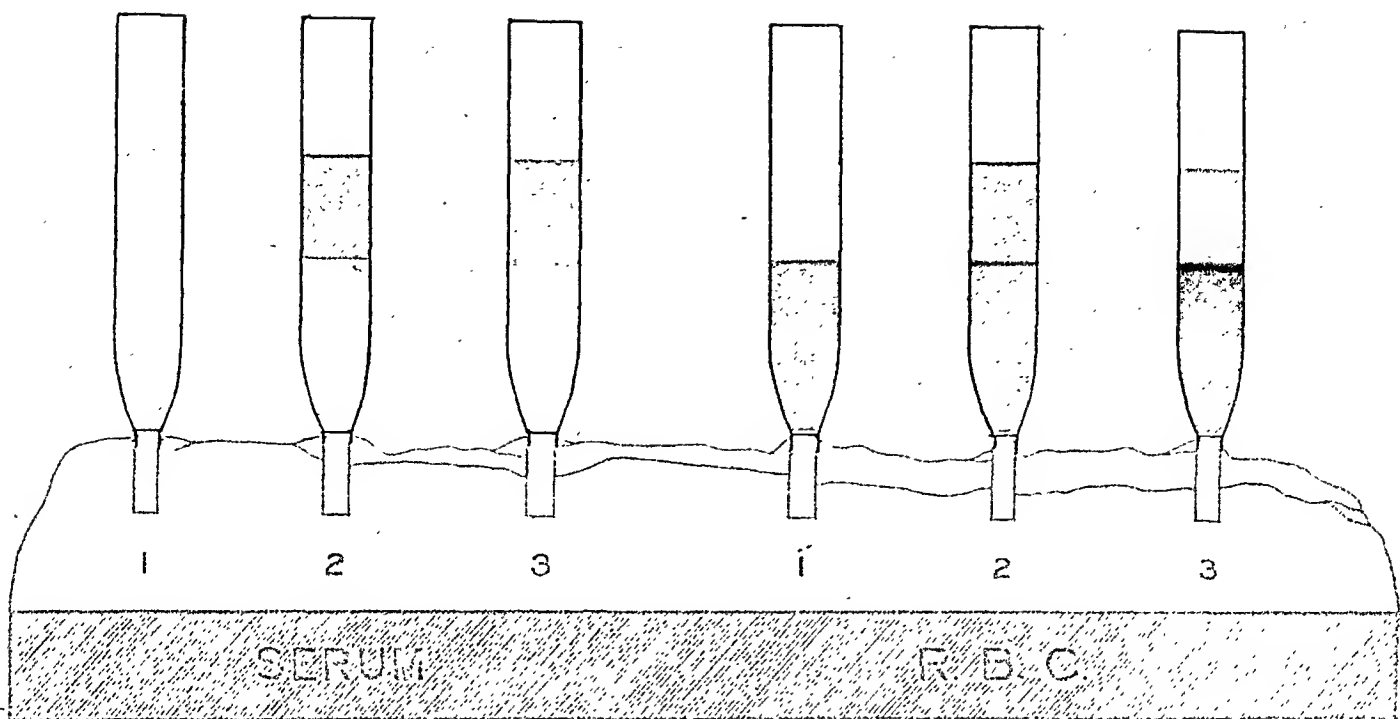


DIAGRAM № III (A)

DIAGRAM № III (B)

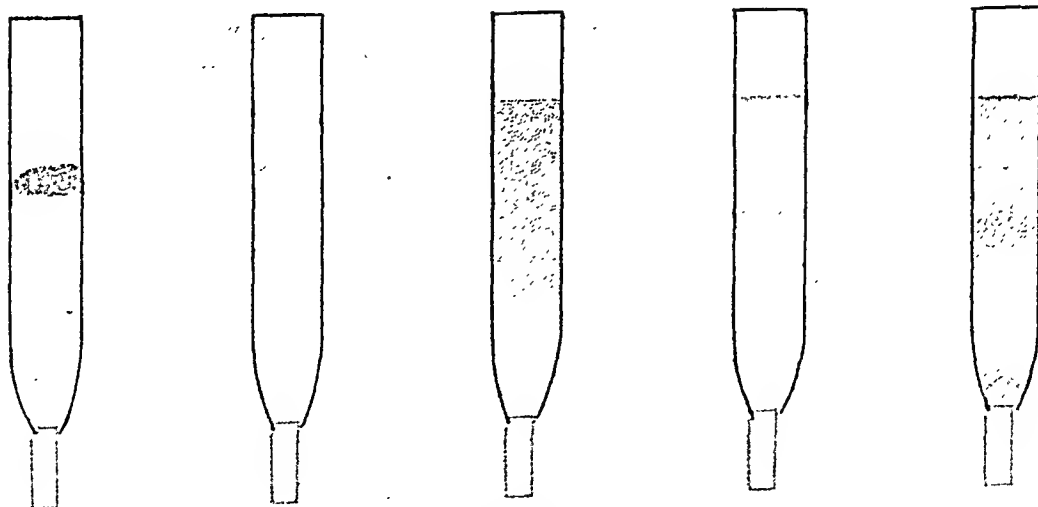


DIAGRAM № (IV)

## (A) COLLOIDAL GOLD.

According to the method used in the preparation of this colloid, two quite differently coloured suspensoids can be obtained—one of a blue colour, the other red.

*Colloid Gold, Blue.*—This suspensoid may be prepared by reducing a pure alkaline aqueous solution of gold chloride by means of a weak formalin solution. I believe the red colloid can also be obtained by this method, but I was unsuccessful and found it easier to prepare as follows.

*Colloid Gold Red.*—This is easily obtained by the reduction of pure gold chloride by means of tannic acid.

As soon as the colloid state is produced, a little sterile and carefully prepared gelatin is added. The object of this addition will be commented on later.

## (B) COLLOIDAL SILVER.

The preparation of this is carried out by acting on the compound  $\text{AgNO}_3 \cdot 3\text{NH}_3$  with a weak solution of tannic acid, a blacky brown coloured suspensoid being obtained. A little gelatin is added as in (A).

## (C) COLLOIDAL ARSENIC.

This can be prepared as a metallic sulphide by passing  $\text{H}_2\text{S}$  gas into a solution of  $\text{As}_2\text{O}_3$ . After the production of the colloidal state the solution is boiled and gelatin solution is added.

*Uses of Gelatin.*—Pure suspensoids are very unstable and possess no keeping qualities, as rapid precipitation takes place. To overcome this difficulty, it is necessary to add small quantities of an emulsoid such as gelatin. These emulsoid particles are supposed to form a layer around the suspensoids and thus protect them from precipitation; from a practical point of view the method is certainly successful.

Tests carried out with the colloids prepared as above:—

(1) *Tyndall Phenomenon.*—To obtain this, the individual suspensoids were examined in a small glass vessel with parallel sides. (This piece of apparatus was kindly made for me by Professor Mukerji.) The source of light employed was an electric lamp fitted into a cup-shaped reflector. The whole lighting arrangement was then made light tight with black paper, except for a small hole situated in front of the centre of the reflector. In a dark room this apparatus gave a satisfactory pencil of light. Now, by allowing this pencil to enter the suspensoid in the glass vessel, a cone of light was obtained in all except the silver suspensoid, in which case it appeared as if the pencil of light was too weak to penetrate.

(2) *Diffusion Experiments.*—To test the diffusion of these suspensoids, a row of miniature

test tubes were arranged as shown in diagram (1), and each filled to the height of about one inch with a solution of gelatin sufficiently strong to set to a firm jelly. To the tubes thus prepared were added in equal amounts Colloid Gold red, Colloid Gold blue, Colloid Silver, Colloid Arsenic, and as a control some aqueous solution of copper sulphate. After standing at bench temperature for two hours, the result shown in diagram (1) was seen, no diffusion in the case of the gold and arsenic suspensoids, a little want of definition at the junction line of the two liquids in the case of the silver colloid, and marked diffusion in the case of the copper sulphate. After 24 hours the  $\text{CuSO}_4$  solution had almost reached the bottom of the test tube, whilst the silver showed only a little more diffuseness at the junction line; no attempt at diffusion was noted in the case of the other colloids.

(3) *Filter Paper Capillary Analysis.* (Method of Sahlbohm).—This method of analysis is an easy procedure to enable one to determine the sign of the electric charge carried by the suspensoid. The result obtained is given in diagram No. 2. The substances experimented on being the Colloids Silver, Gold red and blue; Arsenic and Congo red.

The Congo red was the only colloid that did not ascend, and from this we infer that it carries a plus charge on its particles, the other colloids tested carrying a negative charge.

(4) *Precipitation by Salts.*—Before the addition of any emulsoid to the above noted suspensoids, precipitation by salts was marked, after the addition of the emulsoid even in small quantities; stability on the addition of such electrolytes as  $\text{NaCl}$  and  $\text{Mg}_2\text{SO}_4$  was greatly increased.

As a conclusion to this very imperfect introduction of a difficult subject, I must express my indebtedness to the two following Authorities (Hatschek.—An introduction to the physics and chemistry of Colloids. Wolfgang Ostwald's Hand-book of colloid chemistry.)

## II. NOTES ON TOXICITY.

In order to obtain some idea concerning the degree of toxicity of these suspensoids, the following experiments were carried out:—

I. *Experiment.* (Red Blood Cells)

A series of miniature test tubes were arranged in plasticine, and to each tube an equal volume of a 5 per cent. solution of washed goat's red blood cells was added, and finally an equal quantity of the suspensoids in the following order—arsenic, gold, silver. (See Diagram No. III B.)

*Result.*—Diffusion did not take place to any extent between the two solutions, and no hæmolysis was observed up to one hour.

## II. Experiment. (Serum)

This was carried out on the same lines as experiment I, using serum in the place of the goat's red blood cells. (See Diagram No. III A.)

*Result.*—No precipitation was observed at the junction of the two liquids, nor did diffusion take place to any extent up to 24 hours.

## III. Experiment. (Conjunctiva)

To ascertain the effects of the suspensoids on a delicate membrane, drops of the various suspensoids were instilled into the conjunctival membranes of a series of rabbits, only one eye was used in each animal, the other acting as a control.

*Result.*—No animal showed any sign of conjunctival irritation.

## IV. Experiment. (Subcutaneous)

A series of rabbits were taken and each was injected into the flank as follows:—

Rabbit No. 1.—Twenty minims, colloidal gold.

Rabbit No. 2.—Ten minims, colloidal silver.

Rabbit No. 3.—Ten minims, colloidal arsenic.

*Result.*—None of these injections gave rise to any inflammatory trouble at the site of inoculation, nor was any systemic effect observed.

## V. Experiment. (Intravenous)

No reactions in the foregoing experiments being obtained showing toxicity. A series of rabbits were given the following intravenous injections into the marginal vein of the ear.

Rabbit No. 1.—Ten minims, colloidal arsenic.

Rabbit No. 2.—Twenty minims, colloidal gold.

Rabbit No. 3.—Twenty minims, colloidal silver.

Rabbit No. 4.—Forty minims, colloidal gold.

These solutions were not rendered isotonic before injection.

*Results.*—In none of the series was any toxic symptoms noted.

## CONCLUSIONS.

The above series of experiments seem to denote a very low degree of toxicity on the part of the suspensoid experiment; in other words, their organotropic properties are very mild. So the next question that naturally arises is their toxicity for the lower forms of animal life, or what may be called their parasitropic properties.

## III. EXPERIMENTS IN VITRO ON PARAMÆCIUM.

*Parasitotropic Properties.*—To try and obtain some idea of this, experiments were conducted in vitro on paramæcium, using solutions of quinine hydrochloride and quinoidine as controls. The toxicity of the former drug has been worked out by Sir Leonard Rogers, I.M.S., and the latter by Major MacGilchrist, I.M.S. Antimony tartrate was also experimented with, as a metal in the non-colloidal state, and closely related to the metalloid

arsenic, both chemically and pharmacologically speaking. The first series of experiments were carried out on a microscopic slide after the method used by MacGilchrist (*Indian Journal of Medical Research*, Vol. II, No. 1, p. 316).

## EXPERIMENTS.

(A) One drop of paramæcium culture was placed on a slide and one drop of colloidal gold red was added. The result was observed under the microscope.

(B) One drop of culture and one drop of colloidal silver.

(C) One drop of culture and one drop of colloidal arsenic.

(D) One drop of culture and one drop of quinine hydrochloride, one per cent. solution.

*Results.*—(A) After ten minutes no difference could be noted in the behaviour of the paramæcium.

(B) Shortly after the addition of the silver the paramæcium congregated to the edge of the drop and violent movement was observed.

(C) The addition of the arsenic caused violent movement, and, shortly after, the great majority showed cessation of all movement.

(D) The quinine, on addition, caused violent movement with almost immediate cessation of all movement.

As the gold and silver suspensoids showed such little toxicity, I proceeded only with colloidal arsenic, and instead of using the microscopic method, I used the method described by Sir Leonard Rogers (*B. M. J.*, Sept. 22nd, 1917, p. 383).

The following series of experiments show the results obtained by this method:—

## EXPERIMENT.

### Colloidal Arsenic.

| Dilution.                      | 24 hours. |
|--------------------------------|-----------|
| 1 in 20 with paramæcia culturæ | ...       |
| 1 in 40 " " "                  | ...       |
| 1 in 80 " " "                  | ...       |
| 1 in 160 " " "                 | ...       |

### Quinine Hydrochloride.

| Dilution.   | 24 hours. |
|-------------|-----------|
| 1 in 8,000  | ...       |
| 1 in 16,000 | ...       |
| 1 in 32,000 | ...       |
| 1 in 64,000 | ...       |

### Antimony Tartrate.

| Dilution.   | 15" | 30" | 24 hours. |
|-------------|-----|-----|-----------|
| 1 in 2,000  | ... | +   | +         |
| 1 in 4,000  | ... | +   | +         |
| 1 in 8,000  | ... | +   | +         |
| 1 in 16,000 | ... | +   | +         |

+ = Living.  
- = Died.

# QUINOIDINE

This was prepared from the commercial quinoidine as follows:—

The powdered drug was shaken up with dilute sulphuric acid and then filtered. The filtrate was neutralised with calcium hydrate; this caused a precipitate calcium sulphate and quinoidine, and the latter re-dissolved by again acidifying with dilute acid. The solution was again filtered and evaporated down; this resulted in a dirty blacky green residue, amorphous in form, which rapidly took up moisture from the air. From this residue a one per cent. solution was made up by shaking violently with water.

| Dilutions.     | Medullary. | 15" | 30" | 1' | 24' |
|----------------|------------|-----|-----|----|-----|
| 1 in 1,200 ... | +          | +   | —   | —  | —   |
| 1 in 1,600 ... | +          | +   | +   | +  | —   |
| 1 in 3,200 ... | +          | +   | +   | +  | —   |
| 1 in 6,400 ... | +          | +   | +   | +  | +   |

## CONCLUSIONS:

From the above series of experiments we may conclude that the colloids, gold, silver, and arsenic, possess little toxicity for infusoria *in vitro* as compared with other drugs commonly used in protozoal infections of man. *In vivo* I am at present unable to state to what extent they are useful. In some cases of experimental surra infection in rabbits that were treated by injections of colloidal arsenic intravenously, the course of the disease seemed to be prolonged, but I have been unable to observe sufficient cases thus treated to draw any useful conclusions. In healthy young rabbits I have observed a slight leucocytosis twenty-four hours after injection (intravenous) of colloidal arsenic.

It may be of interest to note here a few experiments that I carried out on rats, which I injected with a lethal dose of cobra venom, and endeavoured to find out if the colloidal metals had any neutralising properties towards this venom. I was led to make these few experiments after reading Acton and Knowles' article in the *Indian Journal of Medical Research*, dated October, 1915, "Studies in the Treatment of Snake-bite."

## EXPERIMENT (1).

In a series of miniature test-tubes a small quantity of a 12 sol. of cobra venom was placed and an equal quantity of the following solutions added and the result noted:—

- Colloidal Gold (red) + Venom Solution.
- Colloidal Arsenic + Venom Solution.
- Colloidal Silver + Cobra Venom.
- Gold Chloride Solution + Cobra Venom.

RESULTS.—(See Diagram IV.)

- No precipitate at first; slight precipitate appearing after some time.

- No precipitate.
- (No precipitate.) Precipitate after five minutes.
- Heavy precipitate.

From the above results I concluded that the only suspensoids likely to be beneficial would be silver and gold. To test the effects of these, a series of rats were taken and the following injection experiments carried out:—

## EXPERIMENT (2).

0.1 gram Cobra Venom was dissolved in five cc. of water as standard Venom Solution.

10 minims of Venom Solution into Rat No. 1. Death in 6 minutes.

10 minims Venom + 10 minims C Gold into No. 2. Death in 8 minutes.

10 minims Venom + 20 minims C Gold into No. 3. Death in 20 minutes.

10 minims Venom + 10 minims C Gold; this was left in contact for 24 hours into No. 4. Death in 12 minutes.

4 minims Venom + 13 minims C Gold into No. 5. Death in 12 minutes.

4 minims Cobra Venom injected into No. 6. Death in 8 minutes.

## Colloidal Silver.

5 minims of Venom injected into No. 7. Death in 10 minutes.

5 minims Venom + 5 minims C Silver into No. 8. Death in 15 minutes.

5 minims Venom + 15 minims C Silver into No. 9. Death in 18 minutes.

5 minims Venom + 15 minims C Silver left standing together overnight and injected into Rat No. 10. Death in 10 minutes.

## CONCLUSIONS.

From these experiments it would appear that these suspensoids would have no beneficial effects in the treatment of cobra-bite.

## A PRELIMINARY NOTE ON AN IMPROVED TECHNIQUE FOR THE DETECTION OF HOOKWORM EGGS.\*

By CLAYTON LANE, M.D.,

LIEUT.-COL., I.M.S.

IN the routine examination of stools for hookworm eggs the work of the Rockefeller International Health Board has proved that the centrifuge increases the positive findings by just over ten per cent. This has been proved independently by the workers in Trinidad and in British Guiana, their results being, curiously enough, identical within one place of decimals.

It is obvious on consideration that, should a portion of stool be completely suspended and then completely centrifuged, the amount of the deposit

\* Received for publication, 25th March, 1918.



after centrifugalisation will be precisely the same as the amount of stool originally submitted to the treatment, less such small quantity as may have gone into solution.

Without attempting to submit any proof on this matter, this being reserved for a future paper, it may be said that the centrifugal method, as ordinarily used, lessens in two ways the amount of matter to be examined. Firstly, the portion of stool which is being investigated is, after being driven into suspension, strained, thus removing a considerable quantity of coarse matter, and reducing the bulk largely. Secondly, if the centrifuge be used to that extent which will bring down all helminthic eggs, a fairly large quantity of fine matter is left behind in suspension and the sediment to be subsequently examined is, to that extent, further reduced.

It is the bulk of the fine matter thus precipitated which interferes with the rapid detection of ova. The bulk is so great that the ova have to be dissipated and spread out over a considerable area to prevent their being covered up and obscured by these fine granules.

The only hope of making examination more rapid, easy, and accurate lies in the removal of this fine matter. It has been found possible to do this by the following procedure.

A measured half c.c. of stool is mixed with a sufficiency of water to fill a centrifuge tube of the size which will be presently used in the centrifuge. It is then thoroughly broken up by persistent shaking in a corked tube until such time as the matter is resolved into its constituent elements. It is then strained through wire-gauze with 100 meshes to the linear inch. This, in practice, allows little to pass which is of a size much larger than a hookworm egg. The fluid which passes through the mesh is centrifuged, for such time and at such rate as experience has shown will in that centrifuge bring down all hookworm ova, in a plain glass tube having a cork at either end.

The upper cork is then removed, and the fluid poured off from the deposit, leaving the latter upon the lower cork. The lower cork is extracted with the bulk of the deposit, which is transferred to a glass slide on which the limits of the movement of the mechanical stage of the microscope have been marked out by a grease pencil. With about one c.c. of water the deposit is removed from the cork and tube, and is spread out evenly over the area corresponding to the movement of the mechanical stage, and thoroughly mixed.

It is then allowed to stand for five minutes, after which time the slide is immersed in water and manipulated till all the yellow matter has floated free of it. Immersion and movement have to be very carefully carried out. I have found that they are most easily controlled by

means of a couple of fine flat rodlets stretched across a square or oblong dish nearly full of water, the slide being manipulated by a sort of double fork which grips it from above, and with which it is caused to move as desired on the rodlets.

It is now claimed that by this method nearly the whole of the obscuring fine matter mentioned above can be removed from the slide, while at the same time, if proper care be taken, few of the ova are washed away. No figures are at present being offered in support of this claim. They are available, but it is desired to add to them considerably before their publication. One striking instance only will be now given.

It has been found possible by the use of this method to collect and count upon an area, measuring  $2 \times 1$  inches, 2,227 hookworm ova from half a c.c. of stool. In the case of the centrifugal deposit from another half c.c. of the same stool collected in the same manner (that is, by taking small portions from 5 or 6 different parts of the stool), it was found that one-eighth of this amount, that is to say, the amount representing one-sixteenth of a c.c., was the largest amount which could be spread out upon an area of  $2 \times 1$  inches, as a film sufficiently sparse and thin for examination. In this latter there were counted 292 hookworm ova, which number corresponds to a total of 2,336 hookworm ova in half a c.c. These figures mean that with a loss of 5 per cent. in the total number of ova, the number of these which can be concentrated on a single slide is increased by 750 per cent., and that the slide contains very little foreign matter to confuse and delay examination.

This great increase in the rapidity and accuracy of the microscopic examination carries with it a corresponding saving in time, energy, and money. It will allow one microscopist to examine some hundreds of infected cases daily with accuracy and without undue fatigue. It will mean that he will have to be fed by more than one "field party," since it will nearly always be quite impossible for so many stools to be collected from one area, whether a town, village, mill, mine, or tea garden.

As already stated, the instance quoted above is only one of a number at present available, all pointing to the value of the new method, which may be called *The Levitation Method*; the interest already displayed in it appears to justify the issue of this preliminary note.

#### TETANUS AND TECHNIQUE.

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FROM time to time—fortunately at very long intervals, as a rule—the British medical journals

publish sporadic cases of operative tetanus, or tetanus which is apparently due to operation, and the fashionable (and no doubt, in a considerable proportion, correct) explanation is the use of catgut for ligatures and sutures. I think it was Mr. Rutherford Morison who remarked years ago that men who employed catgut regularly might go on for many years pooh-poohing the danger, but sooner or later most of them would find that they would lose a patient or two from this cause, and although catgut still seems to be the favourite material we probably all have our moments of uneasiness with regard to it. One distinguished London surgeon, for instance, told me that he always used a particular brand, for the reason that it was stated to be made in Norway, where tetanus was supposed to be non-existent, and there is a considerable proportion of the most careful men who, on account of the fear of tetanus or for other reasons, refuse to use it at all. The evidence in some cases certainly appears to have been conclusive. A surgeon practising in this country, for instance, informs me that he lost three abdominal operations, all performed in one morning, from acute tetanus, and on discussing the disaster later with a New York surgeon found that the latter had also lost an operation case from the same disease, using catgut from the same firm, of the same date. Evidence like this cannot be disregarded, and it may be taken as proved that catgut is at all events one cause of the appearance of tetanus after operation. In temperate climates, in fact, under ordinary conditions, it may very well be the main cause. But in the tropics, where the disease is so prevalent not only after but in the absence of any definite sign of injury, it is even more necessary to be extremely critical as to its origin, especially in operation cases. My own recent experience emphasises this, and may perhaps be of sufficient interest to place on record, in view of the undoubted disadvantages in some respects of the universal adoption of silk. Some time ago, when working in another hospital, I had had occasion to be dissatisfied with the results of the operative work as regards asepsis. In spite of a theatre technique, as careful and thorough as one knew how to make it, the wounds were not healing as well as they should have done. "Stitch abscesses" were too frequent, and every now and then a more extensive failure of asepsis occurred. The ultimate results, fortunately, were usually satisfactory enough, but one felt uneasy and dissatisfied with this condition of things. Over and over again our methods were reconsidered and the details checked and modified, but with no apparent effect. Catgut and tendon were both in use, and samples were sent for bacteriological examination, but with negative results. Gloves, caps, and respirators were all employed, and it was difficult to see

what more could be done. The fluid which collected in the wounds affected was for the most part of a clear serous or sero-sanious description, not to be described as pus, and even where a small quantity of true pus formed there was usually no constitutional disturbance. A routine bacteriological examination of the discharges was not undertaken, but in one clean appendix case, where perhaps an ounce of clear serous fluid was evacuated from the wound after about a fortnight, the discharge was reported as sterile after culture. I took it, however, that in most cases a low form of sepsis must have been the cause of the trouble. Things went on in this fashion, much to our disgust, but without any grave results, when suddenly the question assumed a more serious aspect. A case of severe pyosalpinx, in which both tubes had been removed and a glass drain inserted in Douglas' pouch (the peritoneal cavity having been soiled), developed tetanus, and another case, in which laparotomy had been performed for tubercular peritonitis, followed suit after a few days. In both operations catgut had been used, but the gut was from different sources, and prepared separately. The operations were not performed on the same day, but, curiously enough, the cases were not only in the same ward but in opposite beds. Both these cases died, and every one was naturally very much disturbed, but the tension was somewhat relieved when a patient admitted for operation for an old sinus a few days later developed tetanus—fortunately before any operative measures were undertaken. Eventually I was led to attribute the worst of our troubles, as regards ordinary failures of asepsis, to the use of a too small steriliser, which had been packed progressively tighter with every attempt to stiffen up the theatre technique, and the same cause, with the consequently imperfect sterilisation of towels, perhaps previously exposed on the ground by the dhobi, may account for the tetanus. It certainly would not be fair to attribute these cases to catgut. As regards the general operation results, they improved with the advent of a larger steriliser and strict injunctions against tight packing, and no further cases of tetanus after operation occurred.

Bombay is notorious for tetanus, and I find that the Gokuldas Tejpal Hospital has admitted 43 cases during the years 1915, 1916, and 1917. Of these, three patients contracted the disease in hospital—one during treatment for burns, one for lacerated wound of the leg, the third for a Pott's fracture associated with abrasions. During the present year my attention has again been drawn to the subject by the occurrence of three cases in the wards—originally admitted for scrotal abscess, lacerated wound of the foot, and burns, respectively. The only one in which any operation was performed was the first. In this

case the swelling had been in existence some time before admission on the 20th February, and the part was incised on the 21st. On the 6th of March, symptoms of tetanus set in. No catgut was used at the operation. The prepuce and scrotum were sloughing extensively on admission, and there is no reason to suppose that infection actually occurred in the hospital.

It is the custom in the Gokuldas Tejpal Hospital, as I believe in most hospitals now, to inoculate all cases of serious lacerated wounds with anti-tetanic serum, as far as it is available, and during these three years 82 prophylactic doses have been given in this way. So far as is known only one of these (a lacerated leg wound) has developed tetanus, and in him the injection was made on the second day, amputation through the thigh performed on the seventh, and tetanus developed on the tenth. This case, which ended fatally, is one of those previously quoted. Catgut was used, but infection was presumably previous to the operation.

In this connection, and in view of the difficulty in obtaining the serum at the present time, it may be worth while to draw attention to the fact that the army medical authorities have recently advised and extensively employed in France doses of 500 units, as contrasted with the 1,500 issued as a matter of routine by the Lister Institute. If 500 units is enough in France, it is presumably enough here, and a curtailment by two-thirds would result in a very considerable economy of the serum.

The general question of aseptic technique is a very difficult one in India, and I think we are all agreed that conditions are more adverse here than in Europe. Dust is more prevalent, the temperature favourable to most microbes, Indian servants are not always too reliable, and tetanus is ubiquitous. Here, even more perhaps than elsewhere, it is necessary to remember the fundamental essentials of aseptic and antiseptic surgery, and to look beyond the latest theatre fashions which are sometimes insisted on at their expense. I am personally of opinion that a good many failures may be attributed (as probably in the above quoted instance of the small steriliser, too tightly packed) to imperfect sterilisation. An inadequate high pressure steriliser, like a bad filter, so far from being a safeguard, is merely a trap, and one still occasionally comes across the so-called low pressure Schimmelbusch contrivance, a thing which has always struck me as worse than useless. Rather than use an inefficient apparatus of this description, it is better to rely on the old Listerian methods. Whether ligatures are often concerned—apart from the very rare cases of tetanus due to catgut—it is hard to say, but it is a noteworthy fact that the two theatres which I believe to have obtained the best aseptic results of all those with which I am

acquainted in India have been working with carefully boiled silk and silkworm gut ligatures and sutures, and attribute their success in part to the exclusion of catgut and tendon. As regards special Indian conditions, the officer in charge of a large military laboratory tells me that he finds much greater difficulty in keeping his media sterile here than at home, and no doubt we are entitled to bear such factors as excessive heat and dust in mind in comparing our results with those of European surgeons, but it is not sound to press that excuse too far. More good is likely to result from remembering the limitations of high pressure sterilisers than multiplying the already sufficiently numerous complications of a modern theatre. What is the use, for example, of projecting steam on to the outside of a mass of towels packed together as tight as the pages of a family Bible, or expecting it to find its way into the interior of compressed bandages?

Catgut, for the present, I continue to use to a certain extent, having had unfortunate experience of the trouble caused by silk, sometimes after prolonged periods, both in my own and other people's practice. I do not think that any of the tetanus cases which have come my way were fairly to be attributed to catgut. But the fact remains that this material has been definitely saddled with the responsibility for the disease in certain cases, and the question arises as to whether tendon should not take its place in those tissues, chiefly muscle and fascia, where silk is most prone to give rise to trouble. With tendon for these, fine silk for ligatures for vessels, and coarser silk and silkworm gut for most other work, one would be rid of the catgut-tetanus bugbear a bugbear which, if it only materialises once in 50 years, is too serious to be entirely disregarded.

## A Mirror of Hospital Practice.

### A CASE OF BILHARZIA INFECTION (IMPORTED FROM MESOPOTAMIA, AND OCCURRING IN THE CIVIL POPULATION AT KARACHI.)

By DAGMAR FLORENCE CURJEL, M.D. (Glas.)

*Women's Medical Service.*

THE following case of Bilharzia infection is reported as being of particular interest, as it indicates the presence of an endemic centre of the disease in an important theatre of war (Mesopotamia), where large numbers of British and Indian troops are employed.

It is understood that special precautions are being taken by the military authorities in Karachi to prevent the importation by troops of

this disease from East Africa and Mesopotamia into India. As regards the civil population, apparently no special machinery exists for the detection and isolation of persons infected with schistosomiasis, as is shown in the present case.

The patient, Shah Jan, a girl eleven years of age, was admitted into the Lady Dufferin Hospital, Karachi, on February 6th, 1918, with the complaint of persistent hæmaturia. On questioning her family, the following history was obtained:—The patient contracted the disease about one and a half years ago at Mohammerah. Mohammerah, or Muhamrah, is a town of Persia in the province of Arabistan, in 30° 26' N., 48° 11' E., on the Hafar Canal, which joins the Karun with the Shatt-el-Arab, and flows into the latter forty miles above its mouth at Fao, and about twenty miles below Basra. The population is about five thousand.

The child was born in Karachi, she lived for two years in Basra, and then for six years at Mohammerah. She was in the habit of bathing with other children in the

Occasionally eggs are seen in which the capsules present a crenulated appearance, and which stain irregularly with the methylene blue. The majority of eggs are, however, still capable of hatching out into active miracidia, indicating that the methylene blue is not a specific parasiticide in this disease.

In view of the Ankylostome infection, three courses of treatment with thymol have been given, and the number of Ankylostome ova in the fæces has been reduced.

The patient's weight has remained stationary, and the pulse, respiration, and temperature have been within normal limits.

The development of all digenetic trematodes follows one or other of four lines of metamorphosis:—

| Host.   | Transition.    | Intermediate Host.   | Transition.              | Host.   |
|---------|----------------|--|--------------------------|---|
| Egg ... | Miracidium ... | Sporocyst ...<br>Sporocyst—Daughter-Sporocyst ...<br>Sporocyst—Rediæ ...<br>Sporocyst—Rediæ—Daughter-Rediæ ... | ...<br>...<br>...<br>... | Encysted in.<br>Mollusc.<br>Crustacean.<br>Insect—Adult.<br>Fish.<br>Free—Swimming. |

creeks at Mohammerah. The mother states that at least half the children at Mohammerah suffer from "red water." This is an important fact, and indicates that at Mohammerah there is an endemic centre of Bilharziasis. In addition to the patient, the family consists of father, mother, a girl aged six years, and one boy aged twelve months; none of these has suffered from hæmaturia.

Since the onset of the condition, the hæmaturia has been constantly present, though at times varying somewhat in amount, and the end of micturition is accompanied by the passage of blood-stained mucus. Treatment has been with indigenous drugs. The patient has become increasingly pale and lethargic, compared with her sister who has a good colour (and whom previously she was said to resemble), her pallor is marked.

On admission to hospital the urine was normal in amount, smoky in colour, with a deposit of material resembling gravel (phosphatic) and of blood. Microscopically, it was found to contain eggs of schistosoma hæmatobium. The eggs were watched under the microscope after addition of water to the urine, and after about ten minutes active miracidia emerged from the eggs and swam about with great activity.

*Examination of the fæces.*—No Bilharzia ova were found on examination, but Ankylostome and Trichiuria ova were seen to be present.

#### Blood examination.

Total Red Blood Corpuscles per C. M. M. ... = 3,760,000  
 Hæmoglobin percentage (Gower) ... = 32  
 Colour Index ... =  $\frac{32}{3.76} = 0.4$   
 Total White Corpuscles per C. M. M. ... = 19,525

#### Differential count.

Polynuclear Leucocytes ... = 43 per cent.  
 Large Mononuclear " ... = 3 "  
 Small " ... = 20 "  
 Eosinophyl. " ... = 34 "  
 No malarial parasites present

*Observations on treatment.*—Treatment was started with methylene blue, grain i, b. d., which a week later was increased to grain ii, b. d. Patient has now been a month in hospital under observation. The hæmaturia has gradually decreased, but is still present in small amount. The ova are found to be fewer in number; they take up the methylene blue stain readily.

The researches of Japanese investigators, and particularly of Leiper in Egypt, have shown that the life-history of the Bilharzia worms does not differ in any respect from certain other trematodes, and that, contrary to the older view of Looss, they do not pass directly from man to man, but enter the body of certain molluscs where they undergo a cycle of development.

The newly hatched embryo enters the particular snail and becomes a sporocyst. Leiper in Egypt has shown that the schistosoma of man undergoes development in two kinds of snails—*Bulinus* and *Planorbis*. From the sporocyst, secondary sporocysts develop, especially in the liver of the snail, and within these "bifid tailed" cercariæ are formed, which are not infective till they are fully grown and naturally discharged from the snail. The bilharzid cercariæ are subdivided into two groups, one characterised by the presence of two eyes or pigment spots and of cuticular keels along the bifid portions of the tail, the other without either of these features. The latter type is characteristic of the schistosoma of man, the former represents the larval stage of certain ovian bilharzial worms.

Leiper established the fact that infection of the human host occurs by penetration of the skin. At the moment of infection the tail of the cercaria is discarded and the body burrows into the lymph and blood vessels of the host, whence the liver is reached. In the liver the cercarial body undergoes gradual growth and differentiation. The worms then leave the liver and pass down into the smaller veins of the portal system, where the female begins to lay eggs. Hæmaturia is caused by the passage of innumerable minute hard-shelled eggs causing erosion of the mucous membrane of the bladder of the host.

Leiper's experimental results showed that animals infected with cercariæ from *Bulinus* always produce adult worms which give rise to *terminal spined* eggs only, while those infected with cercariæ from *Planorbis* give rise equally constantly to *lateral spined* eggs. In no case do both varieties arise from the same intermediate host. Moreover, the adult worms reared from these two sources—*Bilharzia hæmatobium* from *Bulinus* and *Bilharzia Mansoni* from *Planorbis*—show constant morphological differences.

From the foregoing account, Leiper concluded that the contamination of water does not result in rendering it infective, unless the special snails are present and a sufficient number of weeks have lapsed to permit of the complete developmental cycle in the snails. Within twenty-four hours of being discharged a large proportion of cercariæ die. Storage for forty-eight hours renders suspected water free from danger, provided no infected shell has been admitted to the storage tank. Boiling immediately kills the cercariæ, and the tablets of acid sulphate of soda used for sterilising water are efficient cercariacides.

As regards experimental treatment, he records a series of experiments which were undertaken on animals experimentally infected with large numbers of *Bilharzia* worms. The drug in each case was pushed till toxic symptoms were evident, and then until the animal died from over-dosage. Dissection in every case showed that the *Bilharzia* worms were still alive, although the doses used were relatively much higher than could have been administered to a human being. Among the drugs used were salvarsan, quinine, betanaphthol, and thymol.

At present, in Karachi and its neighbourhood, no species of snail has been obtained so far which would be capable of acting as an intermediate host to the *Bilharzia* worm, but a careful survey will be necessary to settle this point. The question is one of considerable importance and urgency.

My thanks are due to Major E. D. W. Greig, C.I.E., I.M.S., for much assistance in studying the case of *Bilharzia* infection recorded here.

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#### RELAPSING FEVER.\*

BY MUSHARRAF ALI, L.C.P. & S. (Bombay),

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**Definition.**—This is an acute specific disease, characterised by a sudden onset of fever, its rapid

fall after seven days and its relapse at an interval of from one to seven or more days for an indefinite number of times. This fever is caused by spirochætes, which can be demonstrated in the blood during the febrile period. The spirochætes are transmitted into the body by bed-bugs, body-louse or certain ticks.

**Geographical distribution.**—It is found on every continent—Europe, Africa, America, Asia, and probably Australasia. In Asia, it is known to occur in China, Sumatra and India. In the last-named country, it has been reported from many places. And the Miana disease of Persia is considered to be probably a form of relapsing fever.

**History.**—Relapsing fever was known to Hippocrates, who described an epidemic in the Thasos Island. Ruttty described it in his book on the diseases of Dublin in 1770. Savington in 1857 was the first to report that the disease is transmitted by the bite of a tick now known as the *Ornithodorus moubata*. In 1897, Ticktin stated that the disease was communicated by the common bed-bug. In 1904, Philip Ross and Milni, in Uganda, and Dutton and Todd in 1905, on the Congo, described that the disease was communicated by the bite of a tick (*Ornithodorus moubata*). In 1907, Mackie recorded an outbreak in which lice served as the communicating agent. In India it has been known to occur since 1852, and was investigated by Vandyke Carter, in Bombay, in 1876. Since then it has been reported from many places in the country.

**Ætiology.**—The disease, as already stated, is caused by entrance into the body of one or other form of spirochæte. These germs can be seen through a microscope during the febrile periods, but are completely absent during the afebrile intervals. In some cases they are found in large numbers, while in others they are scanty. In fresh blood, they can be seen in motion. How the spirochætes are transmitted is not definitely settled, but it has been said that the Miana disease of Persia and Carapata disease of Zambesi Valley, which are considered as forms of relapsing fever, are communicated by ticks. The relapsing fever of Europe is supposed to be transmitted by the common bed-bugs and the Indian form by lice, possibly by mosquitoes and bed-bugs, and that of Africa by ticks. It has been stated that the parasite is not introduced into the blood of the victim by the mouth-parts of the insect, as in the case of malaria or trypanosomiasis. The various transmitters suck the spirochæte, which multiplies by breaking up into granules in the gut and malpighian tubes, and is afterwards passed out with the faeces and deposited on the skin of any human being or warm-blooded animal on which the infected insect may subsequently feed. The irritation caused by the bite produces

\* Paper read at the All-India Sub-Assistant Surgeons' conference at Agra.



scratching, and consequently inoculation of the spirochæte occurs. It has also been said that the tick continues to be infective up to a year and a half after sucking the spirochætes containing blood.

Dutton and Todd discovered in Africa that spirochætes could pass into the eggs and larvæ of *Ornithodoros moubata* and confer infective power on the mature tick of the succeeding generation. The spirochætes have been demonstrated in the eggs.

My experience of this disease consists of the observation of 13 cases which occurred in the Bulandshahr jail and police hospitals during each successive hot weather from 1908 to 1911 (with the exception of 1910) while I was in charge of those hospitals. During those years no cases of relapsing fever had been reported from any of the dispensaries in the district. This was probably due to the fact that it was only in the jail and police hospitals that systematic blood examinations were made, while the medical officers in charge of the other institutions had not sufficient leisure to examine the blood of all fever cases.

Probably, indeed, relapsing fever often occurred and was not detected in that district, having very likely been mistaken for malarial fever—a disease which is very rare in that district in the hot weather. Three cases of relapsing fever were detected in 1908 in the district jail, seven in 1909 (5 of which were in the jail and 2 in the police hospital). There occurred three cases in 1911, all in the police hospital. The diagnosis was verified in each case by microscopical examination. Since the cases had all occurred in the hot weather and since the blood of fever patients was examined all the year round, it was very curious that no clue could be found as to how the infection had got access into that district, except that towards the south-west corner of that district, where the Jumna intervenes between Bulandshahr and Gurgaon, a few cases were said to have occurred annually, the nearest point of which is about 25 miles from Bulandshahr. If the disease originated in Gurgaon, it must be re-imported every year or else the infection must be latent during the cold weather.

The ease with which the disease was communicated, is shown by the following facts:—

In 1908, the first case was a convicted prisoner, the hospital sweeper was the next, and the sick attendant was attacked subsequently. Among the cases in 1909, the first case was a convict prisoner; the second was another prisoner who was convalescing after an attack of dysentery and used to sleep in the hospital barrack; the third case was the hospital cook; the fourth the hospital sweeper; and the fifth a sick attendant. There were lots of bed-bugs and lice in the beddings and clothing of the prisoners.

Two cases had occurred in the police lines. The first case had probably contracted the infection from the

jail prisoners, as the prisoners suffering from the disease were segregated outside and a police guard was appointed, and this patient was in the guard. He got this fever 8 days after his return from duty. The second case came from the same barrack. His bed was quite close to that of the first.

In 1911 the first case came from Jhajar, a village near the Jumna river. This man had come from Partabgarh district in Oudh to see his brother, who was most probably suffering from relapsing fever, as known from the history. After 7 or 8 days he himself was attacked by the fever and then came for admission into the police hospital. Two cases came from a police chauki in the town. Both men slept in the same room. Many bed-bugs were found in the beddings.

All the cases described above were between the ages of 22 and 40 years. All except one, who was a Muhammadan, were Hindus, and all (except one who was convalescent after dysentery) were in good health before the attack.

I regret that the bed-bugs and lice were never examined microscopically, and it could not be ascertained which was the carrier of the infection.

*Nature of the pyrexia.*—In all cases the fever came on suddenly and went down by crisis. The attack lasted 5 days, and the crisis occurred on the 6th. Out of 13 recorded cases, one case had the relapse on the 11th day, seven on the 13th, two on the 14th, and three on the 15th day.

One case had four relapses with intervals of 8, 8, 8, and 2 days. The last relapse in this case was doubtful, as no spirochætes were detected in the blood during this relapse. One case had two relapses with intervals of 7 and 9 days, and the rest had only one relapse each.

In all cases, blood examination was positive in showing spirochætes during the febrile stage, and negative during the intervals. In one case I found refractive granules of Balfour also. The spirochætes were identical morphologically with those found in the Indian type of relapsing fever.

*Signs and symptoms.*—Almost all cases were first suspected of pneumonia, having the physical signs resembling those of the first stage of this disease. Some of these had signs of acute bronchitis during the attack as well as during the relapse. Almost all cases had a marked jaundice. In every case pain and tenderness were present on the hepatic and splenic regions. Enlargement of liver and spleen during the pyrexia, and their very rapid diminution to the normal size during the intervals, was a very characteristic sign in every case. Two cases had dysentery and two diarrhoea. Three cases had epistaxis. Two had pain in the joints and neuralgia. Delirium was a common symptom in all cases before the crisis.

*Prognosis.*—All cases of 1908 and 1911 recovered. In 1909, out of 7 cases two died, one during pyrexia (rather, hyperpyrexia), and the other at the crisis from heart-failure.

*Post-mortem appearances.*—Congestion of the internal organs—liver, spleen, kidneys, and brain—was present. Liver and spleen were found enlarged, and gall-bladder distended with bile. A film was prepared from a spleen smear which showed spirochaetes in large number under the microscope.

*Diagnosis.*—A positive diagnosis can only be made by means of the microscope, but when this instrument is not available, even before the disease is suggested by the occurrence of a relapse, the combination of signs resembling pneumonia, fever, slight jaundice, and enlargement of the liver and spleen, should make one suspect relapsing fever.

*Treatment.*—Arsenic was administered by mouth in several cases, but had no effect in preventing the relapse. All the treatment was chiefly by diaphoretic mixtures and stimulants.

### A CASE OF GANGOSA AT THE ALIPORE JAIL.

By JAGATPATI ROY,

Sub-Assistant Surgeon.

DR. TURKHUDD, in his interesting paper on gangosa, which appeared in the February, 1917, number of this journal, expressed the opinion that, though he could find no record of the existence of the disease in India yet, he considered it probable that the disease does exist though mistaken either for syphilis or leprosy.

The following notes of a case of gangosa, in a prisoner at present in the Alipore Jail, confirms

He gives a history of small-pox 19 years ago, when he was about 16 years old. The eruption cleared up with the exception of onculcer between the eyebrows at the root of the nose. This did not heal but spread gradually all over the face, healing from behind and leaving the present scarring. It thus extended to the margins of eyelids, cheeks, nose, and to the upper lip. He had distinct catarrhal condition of the throat. The ulceration extended to the nasal cavity, the nasal cartilages sloughed away gradually. The disease lasted for nearly two years, after which the ulcers healed leaving his face in the condition shown in the photographs. He had sore throat throughout the period of the attack, to which he is still subject. It was sometimes less and sometimes more. He could not say whether he had any definite ulcer in the throat or palate, but he felt his throat was very sore, and his breath was offensive. He used to cough much. The ulcers on the eyelids have become chronic. Eyes do not trouble him much except that they water almost all the time with slight intermission.

He is married, and his wife is still living. Has a healthy daughter, about 1½ years old. His present condition is well shown in the photographs.

Extensive scarring on the face from above the eyebrows to upper lip. The skin is loose and shiny. Eyelids ulcerated with a large ulcer on each outer end of the upper lids, which are partly everted. Lower lids everted, no eyelashes. Nose fallen in owing to necrosis of cartilages; it is merely represented by a small vertical fold of skin. Orifices constricted, cartilages destroyed. Through the orifices much congested mucous surface is seen, and nasal canals have become as one large cavity. The inferior turbinated bones are absent. No discharge from the nose but the odour is offensive. The sense of smell is lost, the voice is slightly nasal.

Mucous membrane of the pharynx much congested. Uvula congested and elongated. Some granulation tissue is seen over the mucous membrane of the throat. Tonsils much enlarged, congested, and fissured. Sense of taste is present. No perforation of palate noticed.



Fig. 1.



Fig. 2.

his views and proves that the disease, at least, occurs in Bengal.

G. S., Hindu Kawra, male, aged about 35 years, fairly nourished, medium build, dark complexion, height 5' 2½", weight 105 lb., healthy-looking, a resident of Budge Budge in the district of 24-Parganas, Bengal, was admitted to jail, under trial, on 9th January, 1917.

General health good. No other organic disease. Glands of the groin and neck not enlarged. No signs of voncreal disease.

These notes are published by kind permission of the Superintendent, Lieutenant-Colonel John Mulvany, I.M.S.

Recurrent Fever  
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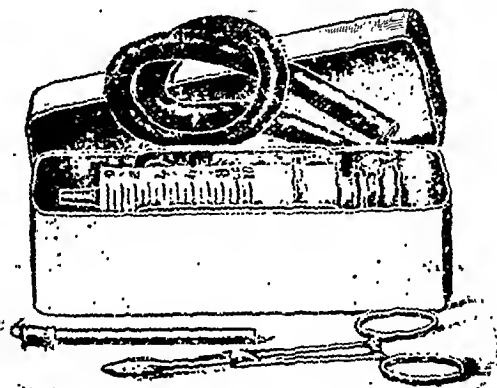
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Hectine is not only a specific in syphilis, but it acts as a general tonic in the treatment of bloodless and anæmic patients and in all cases where **Arsenic** is indicated.

In malaria it acts as a specific owing to its anti-parasitoid and anti-thermic actions; also in tuberculosis, rachitism, neurasthenia, asthma, chorea, skin diseases, etc., etc.

**Hectine** is supplied in hermetically sealed ampoules for intramuscular injections.

Ampoules A—containing 10 c.g. in 1 c.c.

Ampoules B—containing 20 c.g. in 1 c.c.

Pills (in phials of 24) 10 c.g.

## HECTARGYRE

(Mercurial Salt of Hectine)

Hectargyre being a **double specific** cures syphilis and all its manifestations more rapidly and more surely than any other mercurial preparation.

As a treatment following Galyl, or *ab initio* in all stages of the disease, Hectargyre is very effective and rapid; it is well tolerated even where prolonged treatment is necessary; the most intractable cases of syphilis have yielded highly satisfactory results.

Hectargyre is supplied in sterile ampoules for intramuscular injections.

Ampoules A containing—

Hectine 10 c.g. } in 1 c.c.  
Hg. 1 c.g. }

Ampoules B containing—

Hectine 20 c.g. } in 1 c.c.  
Hg. 1½ c.g. }

Pills containing—

Hectine 10 c.g.  
Protoid of Hg. 1 c.g.  
Opium Extract 1 c.g.  
(In phials of 24 pills.)

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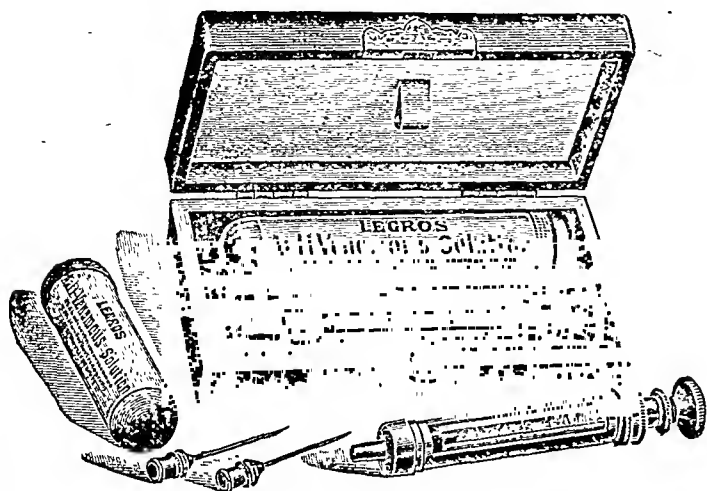
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# Rational Scientific Treatment of Bites of Venomous Serpents or Stings of Venomous Insects on Man and Animals.

## THEIR CURE—



BY THE USE OF—

## Michel Legros' Outfit

Dr. Michel Legros' Outfit is put up in a strong little case (3.2 x 1.6 x 0.8 in.) and weighs 1 oz. It takes up no more room in the pocket than an ordinary match box, and can therefore be carried without inconvenience.

Dr. Michel Legros' Outfit contains—

- 1 Tube of Solution for four injections.
- 1 strong metal-mounted Syringe.
- 2 adequate Needles.

Dr. Michel Legros' Solution is always effective and may be kept any length of time.

Separate Tubes of Solution are supplied at very moderate prices.

FULL DIRECTIONS SUPPLIED WITH EACH TUBE OR OUTFIT.

## Rational Treatment of Constipation

By the double action of Secretions and Peristalsis.

## OPOLAXYL

Opolaxyl is a combination of the secretions of the liver (biliary), pancreas, and intestines, with vegetable extract of a non-drastring nature.

It combines all the secretions to correspond to nature's therapy, and promotes a flow of bile and glycogen with their hæmatopoietic and antitoxic properties.

It is a normal regulator of the gastro-intestinal functions; consequently it improves the metabolic exchanges in the entire organism.

DOSE.—For obstinate constipation 2 or 3 tablets, afterwards 1 tablet every 3 or 4 days for a month.

## LEGROS' SOLUTION AND SNAKE BITES.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I beg to send you notes on the use of Michel Legros' Anti-Venomous Solution in cases of snake-bite, which may be kindly inserted in the *Indian Medical Gazette*.

Recently I was called to see a case of snake-bite. A boy, aged about 18, was bitten on his right foot by a cobra at about 7 A.M. The patient immediately after the bite tied a ligature tightly round the leg below the knee with a rope which he carried with him for his cattle, and cried aloud for help. His neighbours hurried up to the place and killed the serpent which lay hidden in an adjacent bush. The serpent was 4½ feet long, and its diameter at the middle was 5½ inches; many native *ojhas* assembled and tried their *mantras*. At about 8.30 A.M. symptoms of poisoning developed, notwithstanding the three additional ligatures tied by the men subsequently. I reached the place at 9 A.M., when the condition of the patient was as follows:—Eyes opened and turned upwards, the tongue fixed between the teeth which could not be separated, the heart's beat was very feeble, limbs cold. At once I injected 15 minims of Anti-Venomous Solution on the right forearm and 15 minims in two places on the right thigh, which was much swollen. After ten minutes I again injected 10 minims into the left forearm and 15 minims in two places near the site of the bite, and made several incisions near the site of inoculation and freely rubbed in crystals of Pot. Permang. I left the patient at 1.30 P.M., when he could speak with ease and all the symptoms had considerably subsided. He only complained of severe pain in his right leg, for which I prescribed hot Permang. bath. Next morning the patient was all right.

From the above it will appear that the life of the patient was saved by Michel Legros' Anti-Venomous Solution.

It is a very simple remedy, administration of which requires no special skill; my tube of solution was about a year old, and I understand the solution keeps well for several years.

The following points are most important:—The venom is not, as a rule, carried immediately in its entirety into the circulation (except in cases when the bite has penetrated into a vein, in such cases death may be caused immediately). The venom first reaches the small blood vessels, by its own action on blood the local circulation is arrested, and this prevents the immediate diffusion of the poison throughout the organism.

When the poisoning symptoms have already developed, a dose should be injected into the healthier tissues above the wound and swollen parts. Another should be given in two or three places near the site of the bite. This may be repeated if the condition of the patient becomes more grave. The solution must be injected deeply into the tissues for rapid absorption. Medical practitioners can easily and conveniently carry a tube of solution containing four doses at the nominal cost of Rs. 4 per tube.

Yours, etc.,

BINODPUR, JESSORE,

S. G.,

20th June, 1917.

Medical Practitioner.

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## The Combined Treatment of SYPHILIS.

## SUPSALVS

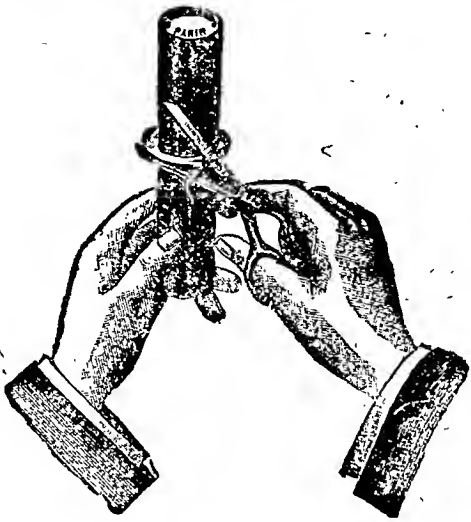
STABLE SUPPOSITORIES OF  
"606" (of French Manufacture)

FIG. 1.

Fig. 1 represents the special patent metallic envelope containing a Supsalv for hot climates. The projecting edge in the middle is cut by scissors—the two ends are then easily pulled apart. The envelope should first be immersed in cool or iced water for 10 minutes.

At the International Congress of Medicine Ehrlich stated that the biochemical action of "606" on spirochaetes is not direct but indirect, a third factor found in the body fluids being necessary.

This success is explained by the well-known experiment of Levaditi: "If living treponemas be placed in a solution of Arsenobenzol (Ehrlich's 606) they continue to live in it. But if a trace of extract of liver be added to the mixture the treponemas are destroyed."

"If 606 has to be taken up and transformed by the liver in order to become toxic to the treponema, there is no better mode of absorption of the drug than by way of the intestine, since all the veins of the intestines join the portal vein. If this be the case no route could be more indirect and more unsatisfactory for active treatment than one that is not intestinal or not intravenous (i.e., prehepatic), since some of the drug must necessarily become fixed everywhere before the passage through the liver has activated it."—Dr. Sabouraud, La Clinique (13-4-1913).

As a result of numerous clinical experiments, Dr. Bagrov, of Moscow, has arrived at the same conclusion, and recommends the rectal method of administration of 606.

**200** cases were treated by the combined treatment in one of the London hospitals. In each case a negative reaction was attained.

Extremely Simple in  
Use.

No Ill-effects.

Most Satisfactory  
Clinical Results.

Rapid Absorption.

## MERSALV

FOR MERCURIAL INUNCTION IN  
CONNECTION WITH SUPSALVS  
TREATMENT.

**CHEMISTRY.**—"Mersalv" contains 10 per cent. metallic mercury, which by a special mechanical process exists in the minutest state of sub-division possible. It is a non-greasy preparation, and, in contra-distinction to other mercurial preparations, contains no organic fats or oils. "Mersalv" is of a white creamy consistence, of pleasant odour, and *cleanly in application*.

In Special Glass Stoppered Bottles for Hot Climates.

## IODOGÉNOL

IODINE in its Most Reliable and Palatable Form.

IODOGÉNOL is a preparation containing Iodine in an organic, assimilable and one might almost say "living" form.

IODOGÉNOL possesses about 38 times the physiological activity of that of iodide of potassium, this preparation has, according to the clinical reports of eminent professors, succeeded where the usual iodide treatment had failed after producing undesirable by-effects.

IODOGÉNOL does not produce Iodism or other bad symptoms.

IODOGÉNOL is an undoubted digestive stimulant and promotes appetite and has a markedly beneficial effect on the general nutrition. It has been tried in many of the large hospitals, and given highly satisfactory clinical results in cases of

Syphilis, Rheumatism, the various phases  
of Tuberculosis, General Debility, etc.

20 minims of IODOGÉNOL are equivalent to 8 grs. Iodide Potassium.

The SCIENTIFIC TREATMENT OF MALARIA  
INFLUENZA AND ALLIED AILMENTS.

## KINECTINE

According to Dr. MOUNEYRAT, the discoverer of Galy and Hectine (the widely adopted Salvarsan Substitutes).

## FORMULA:

Chlorhydrate of Quinine c. Hectine—i.e., Benzo sulfone-para-amino-phenyl-arsenate of Quinine.

Non-toxic, produces no ill-results.

Easily taken (tablets) and well tolerated.

Highly satisfactory clinical results.

Not only a Prophylactic against, but a Specific in,  
**INFLUENZA, Catarrh, Coryza, Hay Fever, Malaria, etc.**

H.M.S. —, 27.7.17.

Sir,—I enclose P.O. for the tube of Kinctine. The drug has given every satisfaction.

W. B. H. W., Surgeon, R.N.

The Anglo-French Drug Co., Ltd., Holborn, London, E.C.

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# IODARGOL

Special Colloidal Iodine.

**NON-TOXIC-  
PAINLESS** FOR THE TREATMENT  
of Gonorrhœa: Acute and  
Chronic. Urethritis: Of  
Old Standing. **DIFFUSIBLE  
ANTISEPTIC  
ANALGESIC**

Cystitis and the Serious Complications of Gonorrhœa.  
In Ampoules and Phials for Injection or Soluble Bougies.

## FOR GYNÆCOLOGY OVULES

**UTERO-TOPIQUE**  
**IODARGOL.** Direct Intra-  
uterine Medication.

As a wound dressing Iodargol on account of its antitoxic and dermoplastic action prevents or ameliorates the fever due to infection, cuts short suppuration, eliminates the sloughing portions and cleans the wound, at the same time stimulating epidermisation and cicatrization.

**IODEOL OVULES** for Vaginitis, Metritis, etc.

**IODEOL CAPSULES** contain 4 grains of Iodine in each.  
Never cause Iodism.

*More powerful and active than Iodine without its  
drawbacks.*

The treatment of Carbuncles, Boils, Anthrax,  
Acne, Styes, and diseases arising from  
**STAPHYLOCOCCUS.**

# STANNOXYL

*(An Oxide of Tin and Tin Metal  
free from Lead.)*

A truly scientific production the value of which  
has been studied very closely. The effect is really  
wonderful; from the second day of treatment the  
pain is relieved and the carbuncles begin to dry up,  
those which are just opening are stopped in their  
course; the core is not expelled but reabsorbed.

In the majority of cases a complete cure is  
effected by the fifth or sixth day, it is seldom  
necessary to take the full 10 days' treatment, and  
relapses are unknown, indeed it is a specific for  
diseases arising from Staphylococcus.

The daily dose for Adults is 4 to 8 tablets;

Children, 2 to 4 tablets.

*Supplied in vials of 80 tablets.*

# URASEPTINE

*The Most Powerful and Effective  
Urinary Antiseptic.*

**URASEPTINE** is a granulated product entirely  
soluble in water, its bases being Piperazine, Urotropine,  
Helmitol, Benzoates of Sodium and Lithium. It contains 60  
centigrams (10 grs.) of active matter to each teaspoonful.

**Dose.**—2—6 teaspoonfuls daily.

It purifies the Urine, and this action is due to its three  
principal properties:

1. It is a **URINARY ANTISEPTIC.**
2. A **SOLVENT** of **URIC ACID** and of  
**PHOSPHATES.**
3. A **MILD NON-TOXIC DIURETIC.**

**INDICATIONS.**—Arthritis, Gout, Gravel, Hepatic and  
Renal Colic, Rheumatism, Calculus, etc., Phosphaturia,  
Urinary Antisepsis, Pyelitis, Bacteriuria, Cystitis, Prostatitis,  
Urethritis, Pyuria, Urinary Abscess, Vesical Catarrh, etc.

## ANTIGONOCOCCIC



The clinical reports given by various doctors show that  
Rheantine gives highly satisfactory results, both in acute  
and chronic forms of Gonorrhœa and also in the various  
infectious complications due to Neisser's bacillus.

Rheantine is put up in hermetically sealed tins, containing  
28 spherules. **Dosage.**—4 spherules a day.

Therapeutic Association of Paris (14th June, 1916) the result of  
their observations:—

"It is not a rare thing," write these authors, "to observe in the  
very first days a more or less marked recrudescence of the  
discharge. This negative phase, which, however, is temporary,  
is always followed by a well-defined positive phase, in the course  
of which the characteristics of the urethral pus undergo a rapid  
change; the discharge, which is at first thick, abundant, and  
creamy, passes gradually into the hyaline state, diminishes in  
quantity, and in the majority of cases ceases."

"Under the microscope these successive stages are demonstrat-  
ed in equally definite stages; whatever may have been the  
duration of the disease, the characteristics of the pus become  
rapidly modified; after two or three days' treatment the gono-  
coccus, first intracellular, becomes exterior; it ceases to act as a  
parasite on the polynuclear leucocytes and the large epithelial  
cells—one then finds them disseminated outside the leucocytes."

"Finally, some days later, if the administration of Rheantine  
is continued, the condition undergoes still further change, the  
gonococci become agglutinated, arranged in a mass, and finally  
bacteriolysed."

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## Indian Medical Gazette.

MAY.

### BLINDNESS IN INDIA.

At a meeting of what is called "The Humanitarian Corps of the College of Ambulance, London" (an institution we confess never to have heard of before), there was a paper read by Mr. C. G. Henderson, I.C.S., on *Blindness in India*, in which he sketched a plan by which blindness could be reduced in India.

It is therefore worth while examining the last Census Report as to the extent to which this terrible infirmity prevails in India. In his paper Mr. Henderson testified to the great work done by Civil Surgeons in India in reducing the sum-total of blindness, especially that due to trachoma and to cataract.

If we turn to page 352 (&c.) of Sir Edward Gait's Census Report (India 1911, vol. I, part 1) we find some pages devoted to this important subject.

Blindness is an infirmity easy to diagnose and not likely to be concealed, consequently if it is insisted that blindness of *both* eyes and not merely dim-sightedness in one or both eyes is meant, it is not likely that many mistakes have been made by the census enumerators.

We, therefore, may accept the figure of the Census Report that "14 persons in every 10,000 of the population" are blind. In America and in various European countries the figure is given as about 8 or 9 (per 10,000), so it is clear that there is a marked prevalence of blindness in India, though Russia with its figure of 19 per 10,000 is in a far worse state.

As regards prevalence and causation, the first point to be noted is that its prevalence varies inversely with the rainfall. It is most common in Punjab, United Provinces, and Baluchistan, where the climate is dry, and dust and glare are excessive, and least prevalent in green and damp Assam, Bengal, and Madras.

This, however, is not the only factor; in colder climates like the hill tracts of Assam or Burma, where houses are built of stone or mud, badly ventilated and with no chimneys, much damage is done to people's eyes by the smoke from domestic fires. A certain degree of blindness is due to

small-pox, but there has been found no correspondence between the prevalence of small-pox and blindness in any part of India.

The domestic causation of blindness is also emphasised by the greater prevalence of the infirmity among women (138 males to 145 females), this is no doubt due to the fact that women spend more time in the smoky atmosphere of their houses, and that they are generally most reluctant to go to hospital for the treatment of their eye troubles.

Blindness is, of course, more common among the aged, the proportion of persons afflicted at the age of 60 being six times as great as it is among those of ages 15 up to 60 years.

The facts as disclosed by the Census Reports are certainly unsatisfactory; there is, however, one consoling fact, and that is the recorded diminution in the period between the two Census Reports of 1891 and 1911. The falling off was from 17 to 14 per 10,000 of the population, and this is ascribed to the smaller number of small-pox cases of blindness, and the increasing readiness of the people to seek hospital relief. Take cataract alone, in the decade ending 1900, there were 154,560 operations for the removal of cataractous lens; in the next ten years this big figure had increased to 174,108 cases.

In the discussion in London, Sir Havelock Charles advocated the extension of ophthalmic travelling dispensaries, and with such views we have every sympathy. The extension of our hospitals and dispensaries, and the growing faith in them and the education of the people in the value of early treatment, these with generally improved sanitation and improved housing conditions must necessarily have a good effect in reducing the incidence of the terrible calamity of blindness.

### A MINISTRY OF HEALTH.

THE following proposal put forward by the Royal College of Physicians in Edinburgh to institute a Ministry of Health is one which will be read with much interest by all medical men. Much attention has been given to this great subject in England in recent days. Whether the scheme is proceeded with now or in the busy days which will follow the end of the war, there is little doubt that the medical profession generally will support any well

considered proposal to co-ordinate and bring under the supervision of a Board of Health the various existing health agencies, *viz.*, Local Government Board, Home Office, Board of Education, and the Insurance Commission.

We moreover believe that the time has come even in India for the appointment of a Minister of Health and that such will surely follow the establishment of such a ministry at Home:—

The Royal College of Physicians of Edinburgh was erected by Royal Charter granted by His Majesty King Charles the Second, 29th November, 1681, and incorporated anew by Royal Charter granted by Her Majesty Queen Victoria, 16th August, 1861.

The Royal College has been, and continues to be, largely concerned with matters affecting the Health of the nation. It has taken considerable part in developing medical science and practice. It is therefore particularly interested in all proposals which have for their aim the erection of a State Department of Health.

The Fellows of the College have given careful consideration to the subject. The statement which follows is the outcome of deliberations, which had regard to the great questions of Health and the urgent need of their recognition and effective handling by the State. The standpoint of the College is frankly medical, not political or departmental.

The Administration of Health measures has in the past been developed in connection with a number of Government Departments, such as the Local Government Board, Home Office, Board of Education, Insurance Commission.

Each of the several Departments has worked within the limits of certain Acts of the Legislature dealing with definite subjects and conferring definite powers.

The Health of the Community has received benefit from the work of the Departments; but the operations of the Departments have not attained that comprehensive measure of success which the extent and gravity of the Health problem demand.

As regards Health questions, the sphere of the several Departments is limited, and, with increasing legislation, the overlapping which inevitably follows from their separation becomes steadily aggravated.

A fundamental weakness lies in the fact that in none of the Departments concerned is the control vested in a Minister appointed primarily to deal with Health problems.

From this division of interest and responsibility departmental difficulties are apt to arise; policy in regard to matters pertaining to Health tends to become subject to considerations of departmental jurisdiction; and the essential interest of Health questions is liable to be obscured.

Under the restrictions of the present system it has been impossible to evolve concerted means for dealing with the complex and ever widening problems of National Health. Not until these restrictions are

removed will it be possible to attain effective and adequate machinery.

What is required is the creation of a Ministry which shall concern itself with Health matters pure and simple, and to whose jurisdiction shall be transferred from other Departments the operations of all existing enactments in so far as they deal with Health.

This opens up another aspect of the question, namely, the immense extent of the issues involved.

Existing Acts deal only with sections and fragments of the subject. A multitude of conditions affecting Health are not included in the purview of the Acts, and have hitherto been left untouched.

The Minister of Health must handle the whole problem. He must be concerned not only with questions already dealt with by the Legislature, such as Infectious Diseases, Infant Welfare, etc., but also with fresh questions arising from time to time, *e.g.*, conditions causing or affecting forms of sickness and disease not yet included within the operation of Health Acts.

Such matters are frequently brought to light in the work of the medical profession. Beyond the treatment of individual cases by medical practitioners there are large questions concerning conditions to which sickness is due. These are certainly matters for a Ministry of Health.

To enable the Ministry to carry out its wide and highly complex functions, a Board of Health should be constituted, and its members selected in such a way as to ensure that the attention of the Ministry of Health would be directed to all matters affecting Health.

The Royal College of Physicians of Edinburgh is, therefore, of opinion that it is essential, in the public interest, that a Government Department should be erected to deal exclusively with Health.

The Royal College suggests:—

I. That the Department should consist of the Minister and a Board of Health, of which the Minister should be Chairman and whose Members should be elected on the ground of experience and interest in matters pertaining to Health.

II. That the purposes of the Department should be—

1. To administer the Health Acts.
2. To devise executive measures for dealing with Health problems not hitherto defined by legislative measures.

3. To institute inquiries with a view to introduce measures for improving conditions affecting Health.

4. To develop facilities for investigation of problems in Health and Disease as they may arise.

III. That the board should include three Groups of Members—

1. Administrative officials.

2. Laymen with wide experience of Health problems, or in the administration of hospitals and other health agencies, officials or voluntary.

3. Medical members who have had experience in—

- (a) Public Health Service.

- (b) General Practice.

(c) Special Clinical Departments, including Industrial Medicine.

(d) Medical Research.

(e) Medical Statistics.

## Current Topics.

### VACCINE THERAPY.

THE notes by Civil Asst.-Surgeon M. Kesava Pai, M.D., of the King Institute, Guindy, Madras, are, as usual, full of interest. They appear as an appendix to Dr. Maitland Gibson's report on the Institute. We extract some of the notes:—

*Furunculosis.*—There were comparatively few cases of furunculosis treated with autogenous vaccines during the year. Of the 10 cases, 3 were cured, 3 improved, and in the remaining four the vaccine was not used or the result was not reported. The three cases that showed signs of improvement without being cured were of the obstinate type characterized by crops of boils coming on almost all the year round irrespective of the season. A change to Bangalore or to the Nilgiris brought about a decided improvement in the condition of these patients, preventing further crops of boils. Immediately they returned to the plains the trouble started afresh, but could then be kept in check by the vaccine injections, without however being completely cured.

*Eczema, pemphigus, and skin eruptions.*—Most of the cases treated under this heading were the usual streptococcal infections of the skin comprizing 'pemphigus.' There was an outbreak of this affection amongst the European troops at St. Thomas' Mount, as happened during the previous year also. A stock pemphigus streptococcus vaccine was used for all the cases, and proved sufficient to cure the majority of them. A few that resisted the stock vaccine had to be treated with the autogenous and the result was very satisfactory.

*Case 21.*—One of multiple abscesses in a young patient of 18 years. He was brought into the hospital with a rigor followed by a temperature of 103°F. The temperature ranged between 101°F. and 103°F. for the next few days and the patient developed numerous abscesses in different parts of the body. The streptococcus was isolated from the pus of one of the abscesses and a course of injections from 2½ to 20 million was given. The temperature came down to normal and the abscesses healed up rapidly, no fresh ones appearing after the commencement of the injections. The case is an interesting one, being a streptococcal infection, and not a staphylococcal one as is usually the case with acute circumscribed abscesses. It was very likely a true pyemic condition, being purely streptococcal in origin.

*Case 28.*—Was an acute mixed infection with streptococci and staphylococci. There was an extensive carbuncle implicating the cheek and lips and looking more like acute, diffuse cellulitis of the face than an ordinary carbuncle. A mixed autogenous vaccine of the staphylococcus and the streptococcus (10:1) was administered in doses of 2½ million (streptococci) rising up to 15 million. There was a rather severe reaction after the first injection with a rise of temperature to 103°F. The later injections however resulted in a steady improvement without reactions and the patient made a complete recovery after the fifth injection.

*Septic wounds and sinuses.*—All the five cases treated were purely surgical in nature and the vaccine treatment was attempted more or less as an experimental measure. Two of them were sinuses resulting from tubercular adenitis, one was tubercular disease of the shoulder joint, one a fistula in ano, and the fifth a long septic sinus leading into a deep pyosalpinx. These were really cases that required active surgical interference and the vaccine treatment naturally produced negative results.

*Cases 37 and 38.*—Were attempts made to treat inflammatory conditions of the cornea and conjunctiva with vaccines. In Case 37 there was considerable chemosis and infiltration of the cornea, along with a nasal discharge from which *B. septus* was isolated. Treatment with the autogenous vaccine did no good whatever. Case 38 was one of granular ophthalmia and pannus with blepharitis of eight years' duration. There was a concomitant nasal catarrh, and cultivations were made from the latter. The autogenous staphylococcus aureus vaccine was administered in doses ranging from 25 to 200 million. Considerable improvement resulted, but it was not possible to say if this was due entirely to the vaccine treatment.

*Case 51.*—Is an interesting case of chronic nasal ulceration of four months' duration in a medical student of the Rayapuram school. The complaint began as a nasal catarrh, to which the patient was subject from boyhood. The present trouble began with an acute cold, on the subsidence of which an ulcer was noticed on the margin of the right ala nasi. This spread slowly upwards causing an excoriated appearance of the whole nasal mucous membrane. A month later the same ulceration occurred on the left side. There was chronic purulent discharge and occasional bleeding from the ulcers. Streptococcus and staphylococcus aureus were isolated and a combined vaccine made and injected. The discharge gradually lessened and the ulcers healed by the time six doses, up to a maximum of 50 million streptococci, were given.

*Case 56.*—Was one of chronic pharyngeal catarrh of many years' duration complicated with follicular tonsillitis and eustachian catarrh. There were very frequent exacerbations of the catarrh wherein the patient used to feel the usual malaise and hardness of hearing, due to blocking of the eustachian canal. Cultivations from the throat gave a mixed growth of pneumococcus and *B. influenzae*. A combined vaccine was made and injected in doses rising up to 1,000 million of each organism. In about eight months there was considerable improvement in the catarrhal condition and the attacks of "cold in the head" which were very frequent had almost stopped. The patient has been advised to take an injection every month for some time longer.

*Asthma, chronic bronchitis, and lung affections.*—Autogenous vaccines were made for 31 cases. Of these, in 9 cases the vaccine was either not used or not reported upon. Of the remaining 22 cases, 3 are reported as cured, 3 as much improved, 9 as relieved, and in 7 there was no effect at all. The pneumococcus, *M. catarrhalis*, and *B. influenzae* were the usual organisms isolated either singly or in combination. In the majority of local cases, cultivations were made from the sputum collected fresh in the laboratory. In 18 cases cultivations were sent by post from up-country stations. Such cultivations, when they reached the laboratory, showed a good growth of the respective organisms and were ready for isolation and sub-cultivation for the preparation of the vaccine, which could thus be supplied almost as speedily as an autogenous vaccine for a local case.

*Polyvalent gonococcus vaccine.*—Increasing evidence is still accumulating year after year of the marked efficacy of the vaccine in the metastatic gonorrhoeal infections,

*viz.*, gonorrhœal synovitis, arthritis fascialis, epididymitis, etc. There has, as usual, been a difference of opinion regarding its utility in acute gonorrhœal urethritis and in chronic gleet. Thus the medical officers in charge of the venereal wards of the Station Hospitals of Bangalore and Poonamallee consider that whilst the vaccine gave eminently satisfactory results in cases of gonorrhœal arthritis and epididymitis, it had practically no effect in cutting short the course of acute gonorrhœal urethritis, though its employment in this stage was a sure preventive of the later complications. For this reason the routine practice in these hospitals has been to give every case weekly injections in an ascending scale, 10, 20, 50, etc., up to 300 million or more. The higher doses of 1,000 to 1,500 million are advocated by some, as they consider that a case cannot be declared as cured and free from infection unless the patient has been immunised to this high degree.

Gonococcus vaccine was used in the Government Ophthalmic Hospital for a large variety of pathological conditions of the eye, including conjunctivitis, keratitis, episcleritis, iritis, iridocyclitis and even optic atrophy. With the exception of the cases of acute gonorrhœal conjunctivitis, no definite results were obtained in these conditions.

**Tuberculin.**—Of the doses of tuberculin issued a large number were of the diagnostic material for Von Pirquet's reaction. A comparatively small number of doses for curative use were supplied, indents having as a rule been complied with only when the Director was satisfied that the cases for which tuberculin was ordered were fit ones for this special kind of treatment. To enable the Institute to select such cases, the Medical Officer in charge of the case was requested to supply information regarding the case on the following points: (1) whether febrile or afebrile; (2) what organ or organs affected; (3) condition of the cardiac and renal functions; and (4) general condition. In febrile cases, especially such as had daily maxima of over 100° F., he was advised not to treat with tuberculin but to keep them under ordinary treatment till the temperature steadied down to a normal of 99.5° F. Pulmonary cases were, as far as possible, excluded from treatment by tuberculin, its administration being restricted to cases with quite normal temperatures. On account of these restrictions the Institute tuberculin was employed almost exclusively in surgical cases, especially tubercular adenitis, with the result that the reports received were uniformly favourable.

Minute doses of 1/100,000 mgr. to 1/50,000 mgr. of bacillary emulsion were tried in the Madras Ophthalmic Hospital in cases of strumous keratitis. As the cases had the usual local and constitutional treatment at the same time, it was not possible to say if the tuberculin injections did these patients any good.

#### THE KASHMIR HOSPITAL.

WE have received the report of the Kashmir Mission Hospital for 1917, and find that, as usual, it contains much of medical interest. In spite of a reduced staff the number of patients treated was no less than 38,934, of which 1,719 were in-patients, and of these 1,345 Surgical cases. The following note by Dr. Ernest Neve shows the good work done on the Surgical side:—

The large proportion of surgical work is shown by the fact that of our new out-patients one in every nine required operation. Of the in-patients only one quarter were medical cases.

Of the 938 major operations, about two hundred were on the eye. There were 96 cases of cataract. In

many the extraction in the capsule is done, but not invariably. Over two hundred major bone operations were performed. Of these 141 were for necrosis or caries, which is common.

In tumours the large number of epitheliomata will be noted. These are almost all of the Kangri burn cancer type. They occur chiefly on the thigh and abdomen and the glands of the groin, and sometimes of the axilla, and require careful removal.

Tubercular disease of joints is on the increase.

Abdominal operations are becoming more frequent. The results will improve when cases of perforating lesion or other profound disease are brought earlier. Ten gastro-enterostomies were performed. Appendicitis is still relatively uncommon, and only eight operations were done. The number of Cæsarian sections was 14. In the *Indian Medical Gazette* (Vol. 52, No. 4, April, 1917) I published an article based on 47 operations performed during the past six years.

Very few major amputations were needed. Hornias are fairly common. I usually adopt Macewan's method with modifications. Hull's new method seems worth trying. Three successful prostatectomies were done. These cases seem to me to need careful selection.

In the minors, the great number of entropions, pterygiums and other eye operations is noteworthy. The scraping of ulcers and opening of abscesses, together totalling 862, and the extraction of teeth (711), go to make up a good deal of minor surgery. There were 21 simple fractures. In one of these there was non-union in the femur. A successful plating was done by Arbuthnot Lane's method.

The total mortality on majors and minors was well under one per cent. Many of the deaths are quite unavoidable. Several patients came in moribund, as for instance, two fractures of the base of the skull, two of acute peritonitis and two bad labour cases which had gone on for days. In the latter 'Cæsarian' gives a chance for saving the child. Then a case of anthrax, with profound toxæmia, died. Again there are other cases which are nearly hopeless, but in which operation may give a chance. On some of these I should not, myself, have operated. In this list we find two advanced epitheliomata, one carcinoma, three more bad labour cases maltreated before admission, one needing craniotomy, two 'Cæsarian' and one forceps, two cases of perineal cystotomy for disease of the bladder, one livor abscess, and one amputation for high gangrene of the arm.

There are, too, always a few chronic surgical cases with exhausting suppuration and final death. Such were a psoas abscess, hip abscess and tubercular disease ankle joint, in which amputation was too late.

Of 28 surgical deaths in the hospital, four were due to injury, five to debility or special toxæmia, such as uræmia, biliary toxæmia, etc., and all the rest were due directly or indirectly to sepsis, incurred before admission.

How this fact emphasises the immense importance of the epoch-making work of Lister.

#### MENTAL DISEASES. NOMENCLATURE OF.—

WITH reference to Army Council Instructions 462 and 1171, the following nomenclature of mental diseases will be taken into use from the date of this Army Council Instruction in place of that shown on pages 35—39, Nomenclature of Diseases, 1906 (List of Diseases, page 4, Nos. 144 to 165 inclusive), and will be strictly adhered to:—

1. Idiocy (variety to be stated).
2. Imbecility.



3. Feeble-mindedness.
4. Moral imbecility.
5. Mania (acute, intermittent, chronic).
6. Melancholia (acute, intermittent, chronic).
7. Maniacal-depressive insanity.
8. Mental stupor.
9. Delusional insanity (acute or chronic).
10. Psychasthenia (Obsessional insanity).
11. Acute delirium.
12. Insanity associated with acute infective diseases.
13. General paralysis of the insane.
14. Confusional insanity synonym, exhaustion psychosis.
15. Insanity due to alcohol (acute or chronic).
16. Dementia præcox.
17. Dementia (primary or secondary).

#### ANTI-HOOKWORM WORK IN SIAM.

THE quarterly reports submitted to the Government of Siam continue to give good accounts of the progress of the anti-hookworm work in Siam. In the city of Chiangmai, of over ten thousand persons examined over 77 per cent. were found infected with hookworm. Infection with other parasites (*Ascaris*, *Oxyuris*, *Trichuris*) was also common.

Owing to the multiplicity of races in Siam the question of race infection is more difficult, but we find the highest percentage of infection in the Kamooks (100 per cent.), North Siamese (74), Chinese (50), Shans (58), Europeans (31), and Eurasians very high, viz., 76 per cent.

*Cures.*—The records for the entire year have been gone over and the corrected list shows that 1,512 re-examinations have been made. Of these, 1,000 were found to have been cured, 197 were still infected, 315 were confirmatory of the previous negative finding. On the original examination of these 1,512 cases, 1,197 or 79.1 per cent. were found infected with hookworm. After treatment, on re-examination 197 only were found infected, or 13.0 per cent. As will be seen in Tables VI and VII, this reduction in percentages was accomplished in most cases by one treatment.

*Permanence of the Eradication measures.*—Emphasis from the beginning has been placed upon the importance of safe disposal of the night-soil. In many places a considerable number of latrines have been erected, and used throughout the period. In some of these places re-examinations have been made to learn what percentage of people were being re-infected. It is very encouraging to learn that in these places re-infection has been slight, after periods varying from three to six months. In fact, 315 of the re-examinations mentioned in Table VI are confirmatory of the continued non-infected condition of those examined. In Table X attention is called to the very marked decrease in the percentage of infection in the villages mentioned among those who have been treated. This indicates not only the effectiveness of the treatment in effecting cures, but also the fact that the measures adopted, even though by only a part of the population, to a great extent prevent their re-infection. It indicates that the soil in this portion of Siam has not become so heavily infected as in other countries or else the floods have the beneficial result of decreasing the infectivity of the soil. It is clearly evident that the absolute eradication and control of hookworm infection in this region is possible if all will co-operate in the effort to persuade each individual to be examined, and treated if found infected.

In the villages mentioned in Table X, there has been a marked improvement in the health of those who took the treatment. There are no morbidity statistics available for comparisons, but the villagers state that there has been almost an entire absence of dysentery and diarrhoea among them since the installation of the latrines, while there have been many cases of remarkable improvement in general health following the treatment.

Constant emphasis has been placed upon the necessity for sanitary methods of disposal of the night-soil. The sanitary pit latrine and liquefaction tanks have been recommended as being the most practicable under present conditions. The platforms are provided with lids to prevent the ingress of flies. However, there is no absolutely automatic fly-proof lid which can be installed at the low cost necessary in these communities. The best "automatic" fly-proof arrangement is a well-informed householder. Repeated inspections of a large number of the latrines installed have shown that as a rule the householders do, in fact, keep them in very good condition.

Liquefaction tanks are much more expensive, they require more attention, and certain local customs present an almost insuperable obstacle to their general use. However, two have been installed. The one at the Prarachaya School has been in use for a number of months and has been very successful.

People living near a river or smaller stream of water as a rule erect a place of concealment overhanging the water.

The progress made in the installation of latrines has been most promising. It is too much to hope to change time-worn customs in such delicate matters within the short period of time this work has been in progress, but a good start has been made, the results of which in most cases will be permanent. It has been impossible to keep accurate records. Those which have been reported and which are known to conform reasonably to the types suggested are tabulated below. The actual number installed is without doubt much larger.

#### SANITARY LATRINES INSTALLED.

|             |     |     |
|-------------|-----|-----|
| 1st Quarter | ... | 7   |
| 2nd "       | ... | 106 |
| 3rd "       | ... | 289 |
| 4th "       | ... | 127 |
| Total       | ... | 529 |

#### PAINLESS CHILD BIRTH.

A LONG discussion took place on the value of so-called "Twilight Sleep" or "painless" labour at the Royal Society of Medicine in December 1917, which is fully reported in *The Medical Press* (December 19, 1917).

Dr. John Fairbairn, of St. Thomas', opened the discussion, and was followed by Dr. H. Roberts and Dr. Thomas G. Stevens, of the Queen Charlotte's Lying-in Hospital. The latter were of opinion that the treatment "should only be used in cases in which the capacity of the patient for bearing pain was greatly below the normal and was evidenced early in labour."

Dr. H. Roberts gave the following summary of his views:—

"I have very little to add to what has already been stated in our paper just read by Dr. Stevens, but I wish to abstract some points for the benefit of the

meeting, in order to decide whether or not this treatment should be generally used.

At Queen Charlotte's Hospital the results were as follows:—

1. The pains of labour were diminished in 90 per cent. of the cases, the amnesia being complete in 46·2 per cent. of the cases.

2. Indications for the commencement of the treatment were the character of the pains, which should be regular and strong.

3. The size of the os-uteri could not be taken as a guide.

4. The number of the injections varied. The indication for the repetition of the hyoscine depended on the general condition of the patient, and the frequency of the pains.

5. In no case was a second dose of morphia given.

6. The memory test could not be relied upon, nor the corneal and plantar reflexes.

7. Very considerable experience is required by the practitioner in the treatment of 'Twilight Sleep.' The same remark applies to nurses who, if left in charge of such cases, should be carefully trained in the routine beforehand, as it is more than possible that dangerous results might supervene if the giving of morphia and hyoscine were left to inexperienced persons. Further, any case of 'Twilight Sleep' demands the constant attendance of the doctor.

8. Mental confusion, thirst, and restlessness were observed in about half the cases, but no active delirium.

9. Labour does not seem to have been prolonged after giving the first injection. In cases noted as prolonged, it was the first stage (*i.e.*) before the injections were given at all.

10. Out of the 67 cases, forceps were used in 12 deliveries, but the indications were due to obstetric complications, such as occipito posterior or large head, and not due to the effects of the drugs or uterine contractions.

11. The placenta was spontaneously expelled in 65 out of the 67 cases, and there was no evidence that uterine contraction or retraction was interfered with.

12. There were two cases of post-partum hæmorrhage, one due to adherent placenta, the other to a low-lying succenturiate placenta. These, however, could not be laid to the door of the narcosis alone.

13. The puerperium in 67 cases was undisturbed; involution was not retarded.

14. Of 53 out of 68 babies (one case of twins), breathing or crying was noted as spontaneous. In 13 cases the baby was described as 'blue,' but in one instance only was there cause for alarm. Most of the blue babies at birth soon recovered. Hot baths and artificial respiration were only required in the minority of cases. Violent resuscitative methods for such babies are to be deprecated. Three babies died. Two were premature, one died of broncho-pneumonia on the sixth day. There were three cases of white asphyxia with forceps deliveries, due to delay from obstetric complications, and not from the drugs used.

15. We cannot express a definite opinion on the effects of hyoscine and morphia on lactation owing to the short stay of patients in the hospital. Of the 64 living babies who left the hospital, 49 were breast fed. Such cases, if possible, should be followed up in the infant clinics as to their subsequent progress.

16. Observations at Queen Charlotte's Hospital showed that of the 64 living babies, 34 had regained their birth weight during the first week.

Our results were very much better in the latter series of cases, owing to our increased experience in the treatment, but 'Twilight Sleep' needs the greatest care in the administration of the drugs, especially the

hyoscine, and the constant attention of the doctor and nurse.

It is not devoid of danger."

#### THE VITAMINES AND SO-CALLED "DEFICIENCY" DISEASES.

THERE are signs of a reaction against the extension of Funk's "vitamine" hypothesis, which (as the *J. A. M. A.* points out, p. 2040, 1917) postulated the existence of a number of unidentified dietary essentials, each of which acts as a protective substance to the organism. According to this theory the lack of one or other of these lead to the development of a specific syndrome—in one case beri-beri, in another scurvy or pellagra.

For beri-beri, opinion is in favour of the view that it is a syndrome, due to the absence of a specific, as yet unidentified, food factor, and similarly the necrosis of the cornea, which in recent cases in Denmark followed the use of *fat-free* separator-milk may, be ascribed to this cause. Just as in the north of Ireland, the efforts of the otherwise admirable agricultural organisation has led to such a sale of butter that the poorer classes largely have to use skimmed or fat-free milk, with the necessary accompaniment of a considerable increase in the number of cases of rickets in the hospitals; though, in the Ulster case, the condition may be simply a "fat starvation." McCollum and Simmonds (*Bio-Chem. Journal*, 1917, p. 181) have recently concluded there are two such deficiency diseases, *viz.*, polyneuritis (beri-beri) and the zeroophthalmia of the Danish cases above mentioned.

In the case of pellagra, on the other hand, recent papers (in the *J. A. M. A.*) continue to reassert the possibility of an infective origin, and scurvy, or at least infantile scurvy, is now being ascribed to intestinal toxæmia.

A BOOK, which many of us looked forward to reading, is the *Indian Corps in France* by Lt.-Col. Merewether and Sir F. Smith.

We are only concerned here to note the very scanty information given on to the medical work of the Indian Corps. It is true there is one allusion to the I. M. S. in the text and a rather feeble appendix (No. II) which talks much and tells us little. We read, however, that "The official list of rewards for services in France, granted to *all ranks* of the I. M. S., contains the names of 76 recipients, and for each instance of bravery or devotion, which has met with recognition, there were numbers of unrecorded cases." The writer, we are glad to see, bears testimony to the silent heroism of the *Kahar*.

We wish some I. M. S. "Black Tab" would arise to chronicle the medical work in France.

WE welcome the first issue of the *King George's Medical College Clinical Society Magazine* (Lucknow, No. 1, Vol. 1, March, 1918).

This Magazine seems destined to be very useful; it is a purely students' magazine, written by and for students.

The first issue contains a very useful article by Lieutenant-Colonel C. A. Sprawson, I.M.S., one of the King George's professors, but now a Consulting Physician in Mesopotamia. Dr. H. Sahai, a house surgeon, has an excellent article on the treatment of kala-azar cases, and it sounds a useful note of warning about the wrong use of tartar emetic. Mr. Y. B. Ranade writes on dysentery and Mr. A. Hamid on ankylostomiasis.

The first issue is certainly promising and highly creditable to the staff and students of the Lucknow college.

THE rarity, not the absence, of scarlet fever in India is well known; but we learn from a useful article by Dr. A. Stanley, the Health Officer of Shanghai (*China Medical Journal*, January, 1918) that the disease is assuming prominence in China and epidemics of considerable virulence have been recorded, especially among the susceptible Chinese, and the outlook as regards prevention is not regarded as hopeful. The prevention is mainly one of personal hygiene, and early and prolonged isolation is the chief measure of control. Sterilization of the patient's throat is the most important measure, and then disinfection of clothing and bedding. The disease is also becoming well known in Japan.

To judge by the report of a meeting of the Society of State Medical Officers, a very pretty quarrel exists or has existed between the medical officers of the various estates in the Federated Malay States and the Government Medical Department. Into the merits of the dispute we do not propose to enter, both parties have in view the betterment of the medical treatment of labourers on the estates, and the dispute is largely one as to whether Government should take over and run by means of large and well equipped hospitals the medical aid to the coolies or permit it to be done, as at present, by small separate estate hospitals.

Incidentally, we learn that the Government Medical Service is profoundly discontented, and when we consider the very poor rates of pay given by Government, we are not surprised.

In the *China Medical Journal* (January, 1918), we note an article by Dr. J. H. Korn, of Peking, in which he discusses the use of antimony in kala-azar, and, as a result of 20 months' experience, he states that "Tartar emetic of B. P.

potency given intravenously in gradually increasing doses, and antimony ointment used as an inunction in NO case produced a cure." These results are very different from those reported in India.

As usual the January issue of the *Transactions of the Poona Medical Society* is good and contains several articles of value, by Lt.-Col. Glen Liston, C.I.E.; Lt.-Col. A. Hooton, Dr. Bharucha, and Dr. Shikare.

## Reviews.

**Elements of Hygiene and Public Health**—By J. P. MODI, L.R.C.P. (Ed.). Calcutta: Butterworth & Co. (India). Price Rs. 4 net.

It is difficult to be original in writing a book on hygiene. The author must necessarily follow the stereotyped lines of water, air, soil, food, disposal of refuse, personal hygiene, infective diseases, and statistics.

In the little work before us, written by Dr. J. P. Modi, of the Agra Medical School, the author follows the usual lines and gives admirable short and accurate accounts of the various subjects.

As Lieutenant-Colonel E. J. O'Meara, I.M.S., points out in an introductory chapter, a great feature of the book is the chapters on village sanitation and in the sanitary management of the great fairs or *melas* that in the past have been responsible for the diffusion of many epidemics, but which, of recent years, have been pretty thoroughly controlled to the great advantage of all concerned.

The chapter on food, written largely from an Indian point of view, is excellent, and the section on milk and the various preparations from it is especially to be noted. The "unprecedented scale" on which *ghee* is adulterated is emphasised, also the need for legislation, if legislation can effect improvement where the profits of cheating are so great. The chapter on refuse disposal deals with this important subject fully, and many methods, both ancient and modern, are described. We sometimes forget the vital importance of this not very pleasant subject. It was the failure to carry this out on a sufficiently large and thorough scale that led in olden days to the abandonment of great cities—hence the ruins of Gaur and Pandua—or of half a dozen older Delhis.

In the chapter on water (at p. 16) the author depicts the well-known insanitary "three-gurrah filter." He rightly emphasises the way to keep it clean, but, except in a few private houses, is the necessary care ever taken? We should have preferred a more emphatic condemnation of this obsolete "filter."

At p. 15 the author quotes a table of superficial and cubic space allowed in jails. In Bengal at least these figures are obsolete, more liberal space having long been accorded.

The chapters on plague, malaria and on the dangerous house fly are excellent and instructive.

We again commend to the reader Chapter XVIII—on village sanitation. It is practical and uncompromising, and is a very useful addition to an all-round useful book, which we can certainly recommend.

**Blood-Pressure (From the Clinical Standpoint).—**

By FRANCIS ASHLEY FAUGHT, M.D. Second Edition. W. B. Saunders Co., 1916. Price \$3.25 net.

We reviewed this book favourably on its first appearance as giving a useful practical account of the important subject it deals with. The original plan of the work has been maintained in the present edition, but a large amount of clinical material and numerous charts have been added, bringing it up to date and enhancing its value. Only a few lines are devoted to the important subject of cholera, in which the author refers to the work of "Rodger and Megraw," but gives no details which would be of value to any one called on to treat cholera. The blood pressure in malaria is also dismissed in a few lines. Apart from the weakness regarding tropical diseases this book can be recommended as a good guide to the subject of blood pressure considered clinically.

**Dorland's Illustrated Medical Dictionary.—**  
Ninth Edition, Revised. W. B. Saunders Co., 1917. Flexible leather. Price 24s. net.

THE ninth edition of this valuable medical dictionary has just reached us. It has been revised and enlarged and contains all words used in medicine, surgery and the allied sciences. The etymology of the words is a special feature, as well as the phonetic pronunciation of each word. Even new War words have been added such as 'trench fever,' 'trench back,' etc.

The numerous tables of dosage, exanthemata tests, signs and symptoms called after individuals, etc., are a very useful feature of the book. Even short medical biographies are given of famous men. Reactions, staining methods, dental terms, anatomical tables are to be found.

It is a wonderful compilation and after many years use we have no hesitation in saying that we have never found it wanting, and it can be strongly recommended to all medical men.

**Collected Papers of the Mayo Clinic, Rochester, Minn.—**Vol. VIII, 1916, Octavo of 1,014 pages, 411 illustrations. Philadelphia and London: W. B. Saunders Co., 1917. Cloth. Price 28s net.

A VOLUME of this size is a sure indication of the work performed at this clinic, and, moreover, some of the original papers have been abstracted and others omitted altogether.

The papers are arranged in sections according to systems, *i.e.*, elementary canal, ductless glands and so on. A large number of articles are devoted to the stomach and include besides surgical work the results of experimental work. It is hardly necessary to specify any particular articles as they are all of a high standard and any of them will repay perusal. A volume of this character is of much more value than the usual annual reports of a hospital in which although there is often much valuable work it is, more or less, hidden away and obscured by a lot of material which, except from the statistical point of view, is of little value. The illustrations, as we have come to expect from the publishers, are excellent.

**Injuries of the Face and Jaw and their Repair.—**By P. MARTINIER and G. LEMERLE, Professors to the Dental School of Paris. Translated by H. LAWSON WHALE, M.D., F.R.C.S., Captain, R.A.M.C.(I). Pp 345. London: Baillière, Tindall & Cox, 1917. Price 5s. net.

No department of surgery has advanced more rapidly during the War than that dealing with the repair of facial injuries, owing to the frequency with which wounds of these regions are met with and their tendency to assume the "explosive" type, with gross comminution of bone and severe subsequent cicatrization. Co-operation between surgeon and dentist is essential for successful treatment, a fact recognised in the establishment of the Queen's Hospital at Sidcup, specially devoted to these cases and staffed by a number of officers possessing both surgical and dental qualifications.

The present work deals for the most part with the manufacture and fitting of prosthetic appliances for the various regions of the jaws and face and is of more interest to the dentist than to the surgeon, but the latter will read with interest the third part, in which the treatment of fractures of Maxilla and mandible by modern dental splinting methods is discussed in detail. The book was evidently written more for the requirements of civil practice than of military and lacks any description of methods of bone grafting for the nose and for filling gaps in the jaw, but nevertheless it will be most useful to all who have to deal with these cases. The translator, whose own work in this department is well known, is to be congratulated on a valuable contribution to the scanty English literature of this subject.

## SPECIAL ARTICLE.

## WAR SURGERY IN AN INDIAN GENERAL HOSPITAL IN MESOPOTAMIA.

BY PERCIVAL S. CONNELLAN, I.M.S.\*

DURING the advance to Bagdad, it fell to my lot to treat a considerable number of wounded in the Indian General Hospital to which I was attached. We were situated about half-way down the lines of communication, and to a large extent our work was that of a clearing hospital, combined with some of the advantages in equipment and staff of a general hospital.

The difficulties of transport in this country are well known. As far as the sick and wounded were concerned, it was done almost entirely by means of river steamers over a length of line 300 miles, which suddenly became extended to over 500 miles in the short space of about a fortnight.

The conveyance of wounded was arranged by stages of one or two days, followed by a night's rest, until they reached Amarah, where for the first time we were able to give them a bath and put them in some comfort into beds.

Little can be done on a river transport ship beyond feeding and changing of the dressings of the more serious cases. Much good work was done in the Field Ambulances and Clearing Hospitals up the line, where every wound was dressed and urgent operations were performed.

Our equipment, as I have said, was that of a general hospital in tents, with an improvised operating theatre in a hut containing good theatre furniture, including two operating tables and a high-pressure steriliser.

A first-class X-ray outfit was invaluable.

The staff was small compared to that of a British hospital, my section of 200 beds having two medical officers, two sub-assistant surgeons (that valuable class of Indians trained in medicine and surgery, and without whom it is next to impossible to treat our Indian patients), eight ward orderlies (being sepoys who have had some hospital training), a couple of dressers and some menial *personnel*, and, finally, one nursing sister, to whose care and devotion some of my patients owe their lives, and all owe a debt of gratitude for comfort.

The character of the Indian sepoy patient differs widely from the British "Tommy," though their anatomy and physiology are the same.

One has to bear in mind that they are practically ignorant of the ways of Western medicine, and, broadly speaking, they have little faith in it; but, they are capable of a great deal of faith in the individual who is administering that treatment, and I have found it well to do nothing to discourage that faith, which maxim might be said to hold good in one's attitude toward one's patient, of whatever creed or nationality.

Then, too, they are impatient to get home, and have but one guide to progress—the presence or absence of pain—leaving their shattered limbs to the care of the doctor so long as they remain painless, but often removing splints and dressings, regardless of the consequence if uncomfortable, very much as a dumb animal would. Their power of endurance is great, but of mental resistance to disease there is very little.

*General lines of treatment.*—The wounded arrived in batches, and as a general rule I found them tired from the discomforts of their long journey, and suffering from

a condition of mental exhaustion that made them very irritable; this I made it my first duty to treat.

The patient was at once put into bed with a complete change into hospital clothing. I think one has to be wounded oneself to realise what this means. To be incapacitated from looking after oneself by a wound, and then to lie in the blood and mud-soaked clothes that one has worn without change for days or even weeks, dependent on overworked orderlies for one's food, and to be carried from place to place, each move causing pain in the wound, is an experience calculated to exhaust the hardiest of us.

The next essential point I found was food, so each man was given a meal of whatever suited his condition best; for the more serious cases milk was the most asked for, for milk is to the Indian almost a stimulant and certainly a tonic. Hot soups or ordinary meals of meat, bread and vegetables for others.

When the patients were comfortably fed and rested in their beds, but not before, I have made it a practice to change every dressing; but I try to do this with as little disturbance to the patient as possible, and only on rare occasions have I found it necessary or advisable to change the form of splinting, or give the patient an anæsthetic on the day of his arrival in hospital; for I think that more harm than good is done by disturbing his first night's sleep in a comfortable bed by the nauseating taste of chloroform, or the change in position of a somewhat stiffened or cramped limb.

Morphia and soporifics I give unsparingly on the first night. By the next morning the patient's outlook on life is considerably improved, and he looks on his doctor with more confidence when he finds that he does not think of his wound alone, and he is more ready to bear the pain involved in the more thorough cleaning of his wound, or submit to being carried to the operating theatre, which, to the sepoy on his first visit, is more like a chamber of horrors than a place for the practice of the healing art.

In dealing with wounds, my practice has been to interfere with nature as little as is consistent with ordinary laws of surgery, and a due regard to the ultimate condition and usefulness of the wounded part.

I regard the general resistance of the patient to sepsis as one of the most important factors in the healing of these wounds, and in this respect it has been observed that the sepoy is more resistant to sepsis than the British soldiers, perhaps owing to years of untreated cuts and bruises in his work at home in the fields, giving him a certain power of immunity in the same way as he undoubtedly has a higher immunity to water-borne and fly-carried diseases.

I would include the mental condition as an important part of the general resistance to disease, and to this end I try to keep the mind of my patient as healthily occupied and as free from worry as it is possible in a country about which it has been said that "the devil owned Mesopotamia and hell, and he elected to live in hell and leave Mesopotamia for us." Good food and plenty of extras such as milk, chickens, tinned fruits, eggs and vegetables, and a varied diet, I regard as important, with the addition of alcohol, sweets and cigarettes if the patient desires them.

As regards local treatment, my aim has been to produce a useful result with sound healing as rapidly as possible, rather than a perhaps more perfect aim of shapeliness, which would take longer and might ultimately be of less use to a man who literally earns the bread he eats by his physical labour. This applies more particularly to fractures, which I will refer to again.

*Special local conditions.*—There are certain local conditions which make war in this country differ from that in most others. The long single line of communication up one of the most difficult of navigable rivers in the world for 500 miles makes it essential that there should

\* From *Bristol Medico-Chirurgical Journal*, December 1917.—Ed.



be no congestion in any particular place, so that a steady and rapid evacuation of wounded may continue; and the length of time taken necessitates active medical and surgical treatment the whole time, whether the patient is stationary or travelling. One has to remember, too, that one's patient will continue to be treated by people under less favourable circumstances than that of a large hospital, until he finally comes to rest in one of the hospitals in India, not as is the case in France in a few days, but in a few weeks.

One has also to be ready to do a sudden rapid expansion should there be a block anywhere in the communication. Sometimes I had to evacuate very rapidly to meet the requirements of the river transport ships, and at others I had to retain my patients longer than was necessary for their welfare for the same reason, though, speaking generally, I am left with an admiration for the way the transport has been managed and the men who have managed it.

The climate of Mesopotamia can only be described as beastly for eight months of the year, good for two months, and wet and cold for two months; it is never a climate to which anyone would come for the benefit of his health; and, finally, it is not the climate that any of the troops fighting in it are accustomed to.

Water is very important to the Indian, so much so that he always describes a place as being good or bad by its water supply. When we talk of taking "a change of air," he speaks of a "change of water." The water of Mesopotamia is bad.

The character of the wounds differed somewhat from those that have been described in France, and from those that I have had to treat in the Dardanelles.

We are fighting here for a considerable extent on virgin soil, and the risk of tetanus is less, though it was not neglected, and most cases received a dose of antitetanic serum. I had only one case, and I heard of few others, even among the wounded Turks. During the early days of the advance, when it was almost entirely trench fighting, there was of course a large number of bomb wounds and of those due to close-range rifle bullets, and only a few due to high explosive shells.

Later there was a fair proportion of shrapnel wounds, and then finally, when the Turks had been dislodged, the majority of the wounds were long-range rifle bullet wounds, with, in the majority of cases, an absence of great severity.

All wounds were of course potentially septic, but the vast majority of clean perforations healed rapidly and well under any form of wet dressing, without any tendency to abscess formation if they were dressed frequently enough, even when the bone had been injured in transit.

The larger wounds were almost invariably septic as usual, but in the majority of cases nature responded well and required little assistance from the surgeon's knife.

*Treatment of wounds.*—Lotions. There has been a great deal of discussion about the various forms of lotions, pastes and powders used in the treatment of gun-shot wounds, and I suppose everybody has his pet lotion, as every lotion has its advocate. In the treatment of those cases I have used mercury, carbolic, potassium permanganate and eusol lotions, hydrogen peroxide, salt solutions of various strength, and salt packs, iodine, bismuth paste, and various powders. I find that for ordinary use perchloride of mercury lotion of a strength of 1 in 2,000 is efficient, easily handled, retains its strength, is unaffected by climate, and can be easily prepared and obtained; for these reasons I have come back to using it as my standard lotion, after straying into the fields of the more complicated and newer lotions.

The same things may be said for the carbolic lotion, and it has the additional advantage of not speiling the instruments; but I think it is a little more irritating,

or rather that there are certain people susceptible to it, and I am one of them.

For large and septic wounds I have found nothing to equal permanganate of potash, and I have found its action to be more lasting than hydrogen peroxide, with which I have been rather disappointed; the latter I found useful in working its way into recesses and cleaning out a wound, but I think its action is mechanical, and there it stops. Permanganate of potash has the advantage of a colour index, which is, I think, more useful than knowing its strength, for the different waters which one mixes with it have a varying amount of material in them to be oxidised in these out-of-the-way places. I use it for irrigation. It is now difficult to obtain.

Eusol lotion disappointed me, because I had heard so much of its high qualities and powers of arresting sepsis, but in my hands I am sorry to say I have found it no more efficient than mercury lotion, and a great deal more uncertain. I think I may have been unfortunate in the preparations I obtained, for I understand that it is made from bleaching powder, and that is itself a very unstable compound. In a climate like this it has to be freshly made every day, and varies in strength from hour to hour, and one's nose seems to be the only guide to its strength. If used too strong it is capable of severe blistering, and if too weak it is useless, and finally it has to be used cold.

I find that most people now use it in conjunction with hypertonic salt solution. When I was treating British wounded from the Dardanelles at Port Said in May 1915, I found the most marked effect of salt solution was to produce severe pain even with a 5 per cent. solution, and I had to reduce the strength to 2½ per cent. Recently, while treating Indians, I have been using 10 per cent., which caused no pain at all, and that has led me to the use of salt packs, which are little bags of salt which I place in the wound and cover with a very wet dressing or continuous irrigation, and I have been pleased with the results in chronic indolent septic cases; they produce pain, however, and tend to cause a little sloughing where the salt remains in contact with the tissue.

Iodine I use for the preparation of the skin, made in solution with spirit, and I think the spirit is more important than the iodine. I have had very little experience of pastes beyond bismuth or bismuth and iodoform made up with vaseline. I have found it useful in cases of sinus with deep suppuration where I wished to avoid frequent dressings, I have never known it do any harm.

Scarlet red I have found of value in chronic ulcers. I have also used calomel for these, and believe it does good in these cases, apart from any syphilitic taint. I use it for Oriental sores.

With regard to the actual dressing of the wound, I have listened to many discussions on the merits of large dressings and small dressings, gauze packs and tube drains.

Fresh air is undoubtedly one of the best treatments for a wound, but dust is not. Given ideal conditions, I would prefer to treat wounds without any covering at all, but in tents and among dust storms it is imperative to have a covering of some sort, and with a limited number of bed-sheets and clothes, it is necessary to have sufficient covering to absorb or spread out the discharge. The best material for this purpose is gauze, outside which I put wool in sufficient quantity to guard the wound from any minor injury, for one knows by personal experience how frequently a sore place becomes knickered, and patients, I find, always ask for plenty of wool. It is true that it shuts out the air, but I think the advantages in comfort of a big pad of wool outweigh those of the thin pad.

I do not as a rule put waterproof sheeting over the gauze, for I find it tends to make the wound and skin around sodden.

Then there is the question of drainage of the wound, and there is no doubt in my mind that the rubber drainage tube placed in a properly dependent position will drain a wound; but a wall of granulation tissue forms rapidly round it, and then it ceases to be of much use; for the first two days after a wound has been opened up for deep-seated pus, I think it is the most efficient form of drainage. There are two other great objections raised to drainage tubes, and they are the risk of erosion into an artery, and necrosis of bone where the tube comes in contact with it; it is therefore well to be on one's guard, and not to put a tube near an important artery. I have no personal experience of this accident, nor have I been told of a specific case, but it is a danger to be avoided. With regard to the second objection, if the tube is removed in a couple of days I have found no evidence of necrosis afterwards.

Gauze inside a wound has the advantage of keeping the wound open, but it does not drain; there is no such thing as a gauze drain. How often has one seen the pus welling up from a sinus or deep part of a wound after the removal of the so-called gauze drain. This is due to the pus clogging the meshes of the gauze in the first place, and sometimes to the drying of the discharge upon the surface of the wound; both these difficulties can be overcome by frequent dressings, that is, to change the dressing as soon as the gauze has absorbed as much of the discharge as it will before it has become clogged.

If the outside dressing be kept moist, the discharge will find its way beside the gauze to some extent.

The main use of gauze I find is to carry one's lotion into the recesses of the wound and retain it there, and this it does satisfactorily. I therefore use my gauze very wet with antiseptic lotion, and lay it lightly into every part of the wound that I can get at, and do not rely upon it for drainage at all.

If the wound is properly opened at the time of operation, it usually drains itself without much further assistance, and if it requires no operation it requires little or no artificial drainage. I think one of the greatest advances in the treatment of the wounds in this war has been the frequent and early change of dressings doing away with the time-honoured policy that the first field dressing was the best, and might be left on for days.

It has been advocated that large and profusely suppurating wounds may be left undressed for several days. I have not had the courage to try it.

*Operative Treatment.*—The main class of operative treatment I have found necessary has been the removal of foreign bodies. The sepoy has an almost superstitious dread of a bullet or other foreign substance remaining in his body, and even if it is causing him no pain, and lies in some unimportant part, he is not happy until it is out. I have found, while putting on first field dressings in the field, that almost invariably his first question is—"Has the bullet passed out?" and if one can tell him that it has, he is much relieved; if the bullet is retained, he regards it as a calamity. Very few of them would think of returning to the firing-line with a bullet inside them, and for this reason I make it a rule, if possible, to remove all foreign bodies where the operation will not endanger life or limb.

In this connection X-rays are essential, and I have made it a practice to have every case that I can X-rayed, and to be present myself in cases with foreign bodies or fractures, for no report by another person can give you that mental picture of the bone in all positions which is so valuable for the treatment of fractures, nor can another person describe the position of a foreign body so well as one can see it for oneself.

The other main field of surgery has been sepsis, and the putting up fractures on the various forms of splints.

In the absence of urgent symptoms, I prefer to wait for a few days to see what nature is doing for the arrest

of sepsis; but if there is any chance of pocketing of pus, the earlier it is attacked the better. Having decided that operation for freer drainage is necessary, the difficult question as to how much should be done has to be decided; and here I have found no golden rule to guide me, for the general resistance to sepsis varies so enormously in different individuals, that in one case the mere evacuation of the pus is sufficient to cause the wound to heal rapidly, while in an almost similar wound, do what one will, the sepsis seems to spread. I therefore take each case on its merits, and keep in mind the patient's general resistance.

On the whole, I am in favour of conservative measures rather than of making large incisions; if the operative interference is not extensive enough, it is easy to do more; but one cannot undo the work of a too free use of the knife.

In this connection the risk of toxæmia from the absorption of toxins from freshly-divided tissues has to be borne in mind, and one may find that one has done harm by suddenly poisoning the patient's system with a large dose of toxins.

Another difficult question I find to answer is—How much of the broken fragments of bone ought one to remove? And here again I would rather remove too little than too much. I remove all fragments lying free in the cavity, and so long as I can leave enough for the bone to unite, I remove those loose pieces which, although attached to living structure, are interfering with free drainage; but I do not remove pieces because there is a question as to their ability to live.

Fortunately, I have had occasion to do very few amputations, as here again with the Indian sepoy circumstances are different from the British soldiers; for whereas to a British soldier who may be a clerk in an office, or who can live a partially sedentary life, an artificial limb properly fitted is often better than a hopelessly fixed joint or crooked limb. This is not the case with the sepoy, who in many cases lacks the intelligence to use an artificial limb properly, or who has, as many have, a great prejudice against them. I think, speaking generally, he would rather keep a limb of any sort than have an artificial one.

*Fractures.*—The fractures I have treated here have been the same as I suppose they are everywhere else; that is, they have been of every variety, from the simple fracture to the compound comminuted one. Many of them, if not all, were septic or associated with sepsis in the tissues around.

The most noticeable feature about them has been the slight degree of displacement, and often the absence of any of the signs of a fracture, which was only discovered by the X-rays.

In the case of septic fractures, I have found the best form of treatment is rest and fixation by splints with a weight extension, and I have not found that much extension has been necessary, especially while active suppuration is in progress; but the gentle and steady pull of weight over a pulley relieves much pain and keeps the limb at rest. I had to evacuate most of my cases, as soon as the suppuration had subsided, and so had not much opportunity of observing the union of the bone. Fractures with a septic wound I have treated as simple fractures by early massage and movement, that is massage from the second day, passive movements on the fourth day, and active movements on the seventh day. I had nobody among my personnel who had been trained in massage, but most Indians have a crude knowledge of it and understand the value of rubbing, so it was not difficult to pick out a few and teach them the art of gentle rubbing, which is so soothing to the patient, and in my opinion so beneficial to the repair of the wounded limb. My aim has been to get a strong, useful and free limb as rapidly as possible, and for this aim early massage and movement is the best treatment I know.

Fractures of the thigh I treated in nearly every case on Hey Groves' thigh splint. I found the same splint valuable for cases of bad compound fracture of the leg, as it is so easy to get at the wound for dressing purposes. I found two side splints placed inside the wire frame along the leg useful for steadying the limb, and as an alternative I used the long straight one; by changing from one to the other, the thigh and knee are kept from becoming cramped. For those with only small wounds I used Macintyre's splint for the first few days, and then swung them in a Salter's cradle, and finally sent them on in a modified box splint or a Croft's plaster splint.

For fractures of the humerus I found nothing better than simply bandaging the arm to the body for nearly all cases; I tried various forms of splints, but nearly always had to abandon them. Wound about the elbow I treated with Hey Groves' simple wire frame, reinforced with a couple of side splints if necessary, and I also used it for big wounds of the forearm.

Fractures of the forearm bones rarely required extension, and X-ray showed very slight displacement in the majority of cases; an anterior right-angled splint with a straight back splint I found as good as any; in many cases simple straight anterior and posterior splints were enough to keep the bones in good position.

*Wounds of special parts.*—Penetrating wounds of the head were conspicuously few. In some cases of scalp wounds the wound had been excised and sewn up before they arrived; they healed by the first intention.

Face wounds on the whole did well, presumably owing to the vascularity of the part, for they were all badly infected from the nose or mouth to start with.

The only case of secondary hæmorrhage which I had was in a wound which had penetrated the floor of the nose; the hæmorrhage stopped almost at once on removing a small piece of necrosed bone.

Abdominal wounds I found very interesting. I was struck by the insidious formation of pus without any rise of temperature. The best guide is the pulse and the presence of even slight rigidity; some cases showed no other sign, though on opening the abdomen I found a large quantity of pus.

I think the best treatment in these cases is to evacuate the pus and not to do too much. I simply open the abdomen, pack off the area, and gently open the abscess with my finger, and carefully swab out the pus without breaking any adhesion, using a tube and, if necessary, a gauze localiser. I do not irrigate until the third day, by which time protective adhesions have formed, and I use permanganate of potash lotion, 1 in 10,000. I make no attempt to find the bullet.

I have had two cases which came under my care. Within the first twenty-four hours I operated on both, and in each case found no injury to viscera, the operation wound healing before the gun-shot wound; and I am sure this is the right treatment, as no harm is done by looking inside, and if injury has occurred, it is better to deal with it before pus has had time to form, if one can be reasonably sure of one's asepsis.

I saw only a few cases of aneurysm, and the chief point that struck me about them was that they were well protected.

Wounds of the chest did well; none of them were tapped and none of them formed an empyema; several of them had slight surgical emphysema.

Wounds of the knee-joint if left alone did well, and I discovered, as others have done, the danger of removing a foreign body too early. I think, speaking generally, no attempt should be made to remove a foreign body for at least six weeks. The joint should be kept at rest on a splint. If the knee-joint is full of pus, I am in favour of tapping it once, and this failing, at once opening the whole joint by an incision across the patella

ligament. They are one of the most difficult classes of case to treat.

Gas gangrene was fortunately uncommon. The chief complication was broncho-pneumonia, which is very fatal among Indians.

I have never seen a case diagnosed as shell-shock in an Indian, though I have seen a few become insane through the stress of war.

## ANNUAL REPORTS.

### VACCINATION IN ASSAM.

THE triennial report on vaccination in Assam is submitted by Major T. C. McCombie Young, I.M.S., and is full of interesting details. We extract the following:—

**Increase of Vaccination.**—Compared with the outturn of work in the triennium 1911-12 to 1913-14, there was an increase of vaccination operations in seven districts during the triennium under review. The increase was most marked in the districts of Cachar (28,256) and Sibsagar (25,007). In both of these districts the number of operations performed in the year 1916-17 was larger than that in any of the preceding five years, this increase in activity being due to the prevalence of small-pox in epidemic form in these districts. In Cachar vaccination was carried on throughout most of the year 1916-17 and the Civil Surgeon believes that almost all villages in the district were visited by vaccinators, and he reports that vaccination operations were done in many villages where persons from 3 months to 60 years old had never been vaccinated. In Sibsagar, part of the increase is attributed by the Civil Surgeon to the abolition of the system of employing licensed vaccinators during the triennium under review. From the table, it will be seen that in the district of Nowgong vaccination work during the past three seasons has continued to make steady progress. With reference to the work in 1916-17 the Civil Surgeon remarks "I personally verified nearly 2,000 cases in parts of the district as widely separated as Bagori, the border of Golaghat, 52 miles from Nowgong station, in one direction and Dhing on the banks of the Brahmaputra, 17 miles from Nowgong in the other direction. A most gratifying feature in that vaccinations have been done in villages where in former years the operations had been invariably objected to." It is noteworthy that 450 'Mahapurushas' and nearly a thousand Kacharis and Lalungs submitted to vaccination last season, although these sects are prejudiced against vaccination on religious grounds. Thanks are due to Dr. Dodds Price, Civil Surgeon, who has continued Dr. Bancroft's excellent work and equally so to Mr. J. A. Dawson, I.C.S., Deputy Commissioner, for their successful administration of the vaccination work, which has had the gratifying result of considerably reducing the small-pox mortality of this district, vide paragraph 4. The increase of 7,869 operations in Darrang is satisfactory and is largely due to the personal efforts of the Civil Surgeon Major J. W. McCoy, I.M.S. The large decrease of 26,438 operations in the Garo Hills as compared with those performed in the preceding triennium is more apparent than real. The unusually large number of operations reported in 1913-14 in this district attracted attention and an investigation revealed the fact that the vaccinators had been falsifying their returns to a most discreditable extent. The defaulting vaccinators were dismissed and the Sub-Inspector at fault was reduced to a lower grade. This Sub-Inspector

has since been replaced by a young and energetic man. The Civil Surgeon reports that he has worked to his entire satisfaction and he is convinced that there has been no falsification of returns by vaccinators during the triennium under review. A notable decrease of 14,828 occurred in Sylhet and is attributed to the abolition of licensed vaccinators. I am not entirely convinced of the accuracy of this explanation and I consider that more activity should have been shown by the vaccinating staff, as the staff of vaccinators was reduced by three only during 1916-17, and this, according to the average of work done by each vaccinator in this district, would only account for a deficit of some 4,000 operations. There is little doubt that in this district in particular, as also in Kamrup and elsewhere, the number of vaccinators is inadequate if judged on the basis of allowing for an annual visit from a vaccinator to each village during the vaccination season. In the course of my cold weather touring in this district I have frequently come across villages in remote areas which had not been visited by a vaccinator for periods of five years or more and this is also noticeable in the Habiganj subdivision. I have asked for information in regard to this from all Civil Surgeons, but the replies received seemed to indicate that sufficient time had not been available for full consideration, and I would urge that the question be taken up in greater detail. Each district Civil Surgeon should obtain, if possible, from the Deputy Commissioner, a complete list of all the villages in his district and should then, with the aid of the vaccination inspecting staff, calculate how many vaccinators will be required to visit every village annually. He should then submit proposals based on these figures for the employment of the number of vaccinators required on the basis of an annual visit. The present system of employing only enough vaccinators to visit each village, ostensibly every second year, and in practice at intervals of anything up to five years or more in the case of villages off the beaten track, is one which experience and the small-pox mortality figures alike condemn.

**The Vaccine Depot.**—During the year 1916-17, 668,559 capillary tubes were loaded as compared with 497,692 in 1915-16 and 547,447 in 1914-15. The increase in the year 1916-17 is due to increased demands owing to an epidemic of small-pox and to the commencement of storage of vaccine lymph in the cold storage room of the Pasteur Institute. This stored lymph will be issued during the current season. Arrangements have now been made whereby all vaccine lymph will be kept in cold storage at the Pasteur Institute for such period as experiment determines to be necessary for the disappearance of all organisms of suppurative from the lymph and up to the maximum period of storage without deterioration in potency. The bacteriological sterility is determined by examination in the Provincial Laboratory and no lymph will in future be issued until its practical sterility has been determined. It is hoped that this reform will prevent the occurrence of axillary abscesses and other septic infections from an infective batch of lymph, which are sometimes seen, although fortunately rarely, and it will also ensure our having in hand at any time an ample supply of lymph to supply a sudden demand to deal with an epidemic.

Four hundred and fifty-one calves were inoculated during the year 1916-17 and lymph was taken from 387 calves and that of 64 calves was rejected. The average number of tubes filled per calf was 1,726 as compared with 1,746 in 1915-16 and 1,684 in 1914-15.

Failure of the lymph supplied to the plains districts in the month of October has been a common cause of

complaint and source of inefficiency in the past. Investigation and observation of the cause of these failures led to the conclusion that the cause had been the exposure of the lymph to the adverse influence of heat in October by too early an issue of the first supply, which was previously sent out from the vaccine depot before the commencement of the Puja holidays, during which period the lymph lay about in the districts until the vaccinators were ready to use it. To obviate this, the usual steps were first taken to exalt the virus by passage through a rabbit at the commencement of the season and to ensure careful selection of vesicles in the first two generations of the strain thus obtained. Arrangements were then made to prevent any delay in the use of the lymph after issue by ascertaining from district Civil Surgeons the latest date on which the lymph would be required for use after the Puja holidays which occurred in the early part of October. The Superintendent of the Vaccine Depot was then asked to make arrangements for the despatch of the lymph from Shillong so as to arrive in the districts on the required date and not before it, and for this purpose it was necessary to carry on issue work in the Vaccine Depot during the Puja holidays. The result of these arrangements has been an entire absence, in so far as can be ascertained, of any defect in potency of the October lymph supplies and this is the first year within the experience of the writer in which this result has been obtained.

Credit is due to the Superintendent Dr. H. G. Roberts and to Sub-Assistant Surgeon Narayan Chandra Das Gupta for their careful observance of the details of the instructions issued.

## Correspondence.

### FLEAS AND PLAGUE.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR.—On page 55 of your Journal (January 1918), Dr S. Mallannah in his Article on "Tobacco, Fleas and Plague" quotes figures for the expenditure on plague by the Government of Bombay.

I would point out that the figures to which he refers relate to expenditure by the Bombay City Municipality in the year 1907-1908.

POONA;  
23rd March, 1918.

Yours, etc.,  
F. H. G. HUTCHINSON, M.B., C.M.,  
LIEUT.-COL., I.M.S.,  
Sanitary Commissioner.

### A PUBLIC HEALTH JOURNAL.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—There is at present no suitable journal in India to deal exclusively with sanitary matters, nor have we any associations or institutes corresponding to the Royal Sanitary Institute of London and the several Indian branches of the British Medical Association. The only two journals that sometimes receive contributions purely on sanitary matters are the *Indian Medical Gazette* and the *Indian Journal of Medical Research*. But these are mainly devoted to medicine and surgery, and bacteriology, respectively.

Considering the progress sanitation in India has made in recent years—due chiefly to Government assistance—it is high time that a separate Public Health Journal was started, on lines similar to the several English journals relating to hygiene. A central Sanitary or Public Health Association with provincial branches should be instituted. All the cities and towns of India have Health Officers now. I would suggest that the initiative be taken by the health officers of the larger cities of Calcutta, Bombay and Madras. The All India Sanitary Conferences which used to be held in pre-War



times almost every year were of great value. If Government would give the impetus and initial start towards the establishment of a permanent Public Health Association it would go a long way, and in course of time an independent Association with a journal of its own, and practically self-supporting, would come into existence. Many years ago Dr. A. G. Newell (formerly Health Officer of Lahore) was editing a Public Health Journal, but it did not survive long.

Until something is done in this direction, may I suggest to you to be good enough to allot some space every month in your valuable journal for subjects on Public Health exclusively?

Yours, etc.,

AMRITARAJ,

L.R.C.P. & S., D.P.H.,

Health Officer, G. & M. Station,  
Bangalore.

## UREA HYDROCHLORIDE.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—With reference to Captain Gillespie's inquiry about quinine and urea hydrochloride injection, I would refer him to Medical Annual, 1916, page 27, where will be found the following passages:—

"Amster strongly recommends this preparation as a local anaesthesia. Using a freshly prepared solution containing 0.125 to 0.25 per cent., to which a few drops of 1-1,000 adrenalin hydrochloride is added, he has performed 200 serious operations. The chief advantage of the solution is that it is non-toxic, is not decomposed by boiling, and produces a lasting anaesthesia, thus abolishing shock and the unpleasant sequelæ of general anaesthesia. He slowly infiltrates the skin along the whole course of the proposed incision, and prepares the deeper layers. Similarly, nerves are carefully separated and infiltrated without injuring or cutting them. Complete anaesthesia is obtained in from fifteen to thirty minutes and lasts an indefinite time. The anaesthesia is due to the infiltration of the nerves and tissues with a granular fibrin, and the anaesthetic period depends on how long it takes the fibrin to be absorbed."

Salana P. O.  
ASSAM.

Yours, etc.,

M. J. HUSSAIN, L.M.P.

## DESTRUCTION OF RATS AND PREVENTION OF PLAGUE.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I have been tempted to publish some of my experiences about Giridih plague which happened 14 years ago, i.e., in September, 1904, while I was posted as the Assistant-Surgeon of the place, as the publication of the paper on the subject from the pen of Colonel G. W. P. Dennys, C.I.E., I.M.S. (retired), has thrown a flood of light on it and cleared up some points which were obscure in my mind.

The history of the plague epidemic at Giridih may be stated very briefly to be as follows:—The town of Pachamba, situated about 3 miles from Giridih, became infected at the end of July, 1904, by an infected man from Calcutta. A big and influential *modi* family became infected, and this family broke up and scattered to several places in the town of Giridih, and one went to Chaitadih within the E. I. Ry. colliery area near the town of Giridih. From the infection carried by the members of the *modi* family the plague spread in the town of Giridih within the railway colliery area.

For the prevention of plague, both the municipal authorities in the town of Giridih and the E. I. Ry. authorities within the colliery area of Giridih, after a time, organised the campaign of rat-killing. The railway organisation was far more effective than the municipal organization. When the municipality was able to kill only 50 rats within their area, the railway authorities were able to kill thousands of rats within their own jurisdiction. Seeing the better work of the railway colliery authorities, the Giridih municipality handed over the work of rat-destruction within the Giridih municipal area also to the railway, the municipality agreeing to pay the cost according to the number of rats killed.

The railway colliery authorities showed good work within the municipal area also. They killed 503 or 600 rats within a short time.

But at this time a peculiar thing was noticed by me. I found that a series of houses in which a large number of rats

were killed had become plague infected. This led me to believe that the infection came to these houses through the rat traps, placed there by the colliery authorities, being themselves infected. I brought the matter to the notice of the then Sub-divisional Officer, Giridih, and the result was that rat-killing within the municipal area of Giridih, by the railway colliery authorities, was stopped.

Now, it appears clear to me that I did an injustice to the colliery authorities in believing that they were using rat-traps before disinfecting them properly. In the light of the very luminous paper of Colonel G. W. P. Dennys, I can now understand that plague cases occurred in these houses because infected rat-fleas were set free, for biting human beings, owing to too much destruction of rats in these houses.

After a time, the Government asked for a report on the plague epidemic in the sub-division of Giridih, with special reference to rat-destruction, from the Sub-divisional Officer, Giridih. I was favoured by that officer with the drafting of the report. The substance of this draft of mine was published by me, subsequently, as an article in the *Indian Medical Gazette* in the issue for January, 1906, page 17. The concluding lines of this article are as follow:—

"I am inclined to think that our experiences in the Giridih sub-division do not throw much light on the influence of the rat or his parasites as infecting agencies, or on the connexion between rat-destruction and plague prevention. If anything, they appear to be against Captain Liston's theory. At any rate, they do not favour it."

Now, with my more extended knowledge about the subject, I should say that, though my actual observation about Giridih plague was accurate, the interpretation of the same as stated above was not quite correct. The fact is, as has been pointed out by Colonel G. W. P. Dennys, too many and too rapid a destruction of rats may help the spreading of plague, instead of preventing the same.

The publication of the above article drew a protest from the then Civil Surgeon, Hazaribagh, in a letter published in the *Indian Medical Gazette*, March, 1906 (page 112), in which he pointed out the colliery version of the case and claimed better results, by having killed 10,337 rats within the colliery area, against 953 rats killed in the town of Giridih.

In reply, I published a letter in the *Indian Medical Gazette*, June, 1906, page 236, in which I pointed out that though the plague epidemic disappeared from the colliery area when 10,337 rats were killed, yet the colliery authorities continued rat-killing even after the cessation of the plague, and have been able to kill subsequently about a lac of rats. So the destruction of 10,337 rats cannot be said to have had marked effect in causing the disappearance of the plague epidemic.

I learnt that the railway colliery authorities were preparing at that time beautiful charts about the rate of rat-destruction in different villages under their charge, along with charts showing occurrences of plague cases in these areas. May we request them to publish these for the benefit of science? It is possible that these charts may throw some light on the vexed question.

Yours, etc.,

SARASI LAL SARKAR,

Civil Surgeon, Rangamati.

## SALINES IN CHOLERA.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Intravenous saline in cholera, in some cases, is a life-saving operation. But the want of good assistants and the absence of facilities in the shape of a raised bed for the patient, good light, etc., in private practice, are in some cases such monumental obstacles to the easy and trivial procedure of cutting down and inserting the canula into the vein, that often one is forced to take to the subcutaneous method reluctantly. During an almost every-day practice of intravenous injection of tartar emetic solution in kala-azar, I have often thought whether the simple method of venepuncture could not be made use of in such circumstances; but, on such occasions, the collapsed condition of the veins by the dehydrating effect of profuse watery purgation came to my mind's eye and put out my zeal for prospective work.

Recently I had to do three cases of cholera where the patients were pulseless when I visited them. All three were adults, and one of these a female; veins were indistinct. First of all I made up my mind to inject into the elbow-veins, and put on a constricting rubber-band above the bend of the elbow; after giving some squeezing down-strokes to help the sluggish circulation and thereby congesting the part, I waited some time and found the elbow veins almost invisible—a few, thin, dark lines—but the veins of the dorsum of the hand were temptingly distended. I penetrated one of these with the subcutaneous needle, and opened the band



expectantly looking to see whether there was any local swelling, but to my great relief of avoiding a cutting operation, the two pints of saline flowed in uninterruptedly.

Similar success attended my two other attempts, but both were through the carpal vein. Considering that the stuff is innocuous, no harm can be done even when put outside the vein, which is in striking contrast to the unspeakable agony of tartar emetic or neo-salvarsan so extravasated. I think the process is worth a trial, previous to the elaborate technique of phlebectomy. It saves a lot of trouble, both to the patient and the doctor. The patient is spared the agony of the knife at the time and of a slowly healing wound afterwards. A doctor can save much time, especially when he has to take up a large number of cases during an epidemic. Another advantage is that the same vein can be repeatedly punctured if repeat injections are needed. Whereas in cutting, if a prominent vein is once used, some other has to be tried on the next occasion.

By making use of the medium-sized needle of the record syringe fitted to the rubber tubing of the saline apparatus, the operation can be more easily and deftly performed than with the big-sized needle used for subcutaneous saline.

In conclusion, I may add that the carpal veins though very prominent easily slip before the needle, which difficulty can be obviated by well flexing the hand on the palmar aspect, whereby the veins are steadied.

Yours, etc.,

BRAJABALLAV SHAHA, M.B.

Calcutta.

### UREA HYDROCHLORIDE.

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In reply to Capt. T. D. W. Gillespie's inquiry in the November issue of the *I. M. G.* as to the quantity of quinine urea hydrochloride to be injected hypodermically to produce local anaesthesia, I may say as follows:—

In the *New York Medical Journal* (1915, II, 708) Amster recommends quinine urea hydroas a local anaesthetic. He has performed 200 severe operations with a freshly prepared solution containing 0.125% to 0.25% to which a few drops of 1-1000 adrenalin chloride is added. The skin along the whole course of proposed incision is slowly infiltrated and deeper layers are prepared. Nerves are carefully separated and infiltrated without injuring them. Complete anaesthesia is produced in from 15 to 30 minutes and lasts an indefinite term, i. e., until the granular fibrin which is infiltrated in the nerves and tissues is absorbed.

Leigh F. Wilson (in the *Journal of A. M. A.*, 1915, Vol. II, 1102) discusses the use of a strong solution (1 to 4 c. c. of 30 to 50 p. c.) in cases of hyperthyroidism, the skin over the area to be infiltrated is anaesthetised with 0.1% cocaine or novocaine 0.25%. The injection is repeated every third day, choosing a fresh site each time. Generally 8 to 15 infiltrations are required to improve the general symptoms and for the disappearance of the bruit. These strong solutions produce extensive inflammatory changes and necrosis of thyroid cells. The injections are almost painless and there is no subsequent discomfort.

B. M. Iwanow (*B. M. Journal*, Vol. 1, 610) performed 63 operations under local anaesthesia. The solution was prepared by Messrs. Parke Davis & Co. in ampoules.\* Besides the injections he poured some of the fluid over cut tissue. The operations included fibromata, cysts, tuberculous glands, glands in the neck, varicose veins, on bones for removal of shrapnel particles, and for hernia. Injection was made half an hour before operation. The effects of anaesthesia developed in about 10 to 15 minutes and as a rule lasted 2 to 3 days and sometimes several days. It is not injurious.

E. H. Terrell (abstracted in the *Prescriber* December 1916, 262) writes that he advocates the solution for injection in strength from 1 to 20%, according to the age of the piles and the amount of fibrous tissue it contains. Sloughing rarely occurs. The injection is done in the body of a pile. Just enough to slightly distend on each succeeding day until all are treated. Small quantity of a greater strength should be used.

J. R. Garner uses 10 c. c. of 1 p. c. solution with excellent results in sciatica. The injection is done where the great sciatic nerve emerges from the pelvis through the great sacro-sciatic foramen. A few drops of the solution are injected first into the skin, and after a few seconds the needle is pushed into the nerve and the solution is then injected slowly.

DEJOO TEA CO., LD.,  
North Lakhimpur P. O.,  
ASSAM.  
27th March, 1918.

Yours, etc.,

RAJENDRA KUMAR SEN.

\* N.B.—Each ampoule contains 5 c. c. of a 1% sterile aqueous solution of Q. U. Hydro. Supplied in boxes of 6 ampoules.

### CURATIVE AND PROPHYLACTIC EFFECT OF SODIUM CACODYLATE IN MALARIA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Since the publication of the effects of sodium cacodylate, I have been trying it on my patients and getting a very good and marvellous result from malaria patients. Though it is said to have a better result in syphilis, I doubt to proclaim its efficacy in that disease. I have applied it in various stages of syphilis, but unfortunately without any good result.

In malaria patients I use it hypodermically in doses of  $\frac{1}{2}$  to 2 gr. dissolved in sterilized water every third day. From the administration of a first dose, the time of the febrile attack begins to postpone, though not checked completely. The virulence of stages (i. e., cold, hot, and sweating) is lessened. The second dose checks the febrile attack. In simple cases, only three injections are required to produce a cure. In malignant and double tertian forms, six to nine injections are often required. It should on no account be administered at the height of fever.

It is better to administer it during the time of remission; if not, in the third stage. I have not remarked any effect in the first stage. Oral administration does not appear to produce as good result as in hypodermic injection.

I am using it as a prophylactic also. In touring officers who are likely to visit malarial districts, I give three injections every third day before the time of their departure; I have not ever heard of any complaint from any of them.

It is, I think, much better than quinine on the following grounds:—

1. Less costly.
2. No need of frequent administration every day.
3. No bad taste.
4. No after-effects.
5. Hæmoglobin and red corpuscles much increased in quality and quantity.
6. Good effects in malarial cachexia.
7. Tonic effects.

Hence, I appeal to the authorities to supply all the charitable dispensaries in the mofussil with sodium cacodylate and publish its merits to the ignorant public.

Yours, etc.,

SUKES LOBHON SEN, L.M.P.

Mayurbhanj State.

Sub Assistant Surgeon.

Karanjia Dispensary.

### CONSTIPATION IN MALARIA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—The following notes will interest many of your readers. During my annual inspection tour, I had camped in a village where malaria this year was very much prevalent. In fact, not a single person in the village escaped its attack. The village named is Budhapur, about half a mile distant from the N.-W. Railway line and a mile from the River Indus. On the day I arrived there, I was requested by a few of the principal village-men to see a cultivator suffering from 'Mousam-jo-Tap.' He was very ill to leave his bed. I immediately complied with their request and saw the man in his hut in the heart of the village. The room in which he was lying was too dark to make any observations, so I had him removed out in the open courtyard on a charpoy. He was in a semi-moribund condition. He gave very incoherent answers to my questions. He appeared to me in great distress. From inquiries I learnt that the man was in the habit of exposing himself even with 'Mousam-jo-Tap.' He was a big, swarthy fellow, deep-chested and muscular. His skin was hot to the touch. The temperature 104°—pulse very rapid, about 130 per minute, feeble. He appeared to wince on making pressure over the splenic area. His spleen appeared to be three fingers' breadth below the left costal margin. Eyes congested and his breathing was rapid and harsh. Crepitant râles were heard over the front of his right lung. Percussion note was dull. Cough was very troublesome and sputum was rusty. The man had evidently acute malaria, and on the top of it he had developed pneumonia. I had in my medicine chest none of the drugs for the treatment of pneumonia. From the history I learnt that the patient was usually constipated and had not moved for the last 4 or 5 days. I at once decided to give him a full dose of calomel that very night. I had not apparatus for giving him an enema, and felt a bit diffident in giving him calomel, as his heart appeared to be weak. Five grains of calomel with 10 grains of sodi. bicarb. were administered by the mouth in lukewarm water. Fortunately he swallowed it and could retain the same. He started purging at 3 A.M., and continued to do so for the whole of next day. His stools were very offensive, so much so that his attendants had to leave the

room where he lay. At 10 A.M. next morning, I gave him 10 grs. dose of quinine in tablets, as I had no powder or acid to make up a mixture. This large dose was followed by 3 grs. of quinine every two hours for the first day till 25 grs. of quinine were administered on the first day. On the same day I again saw and found him decidedly better. He could answer my queries rationally and evidently seemed to be on the turning point. I ordered 18 grs. of quinine on the second day, 3 grs. every two hours, and when I saw him on the evening of second day I was very much pleased with the progress. The fever had considerably gone down, being only 100°. The skin felt soft and moist. His pulse was firm about 120. The patient was anxious and cried for more food, which I had stopped on the very first day, having placed him strictly on milk-diet. The crepitant râles were still heard below the angle of right scapula, and cough was the only troublesome symptom noticed. His spleen had retracted almost to one finger's breadth and was very much less painful. I put him on the ordinary expectorant mixture and kept pushing the quinine dose to 18 grs. to be given every day. On the fourth day, as I was moving my camp and being very busy, I had no occasion to see him. But I learnt that he was quite cheerful and was sitting up in bed.

In this case I have made the following observations. That mosquitoes thrive on stagnant, foul pools of water; similarly with severe constipation in a person attacked with malaria, the first thing that should strike a physician is to give his patient a full dose of a purge that has combined in it an antiseptic effect. Calomel is a powerful antiseptic as well as efficient purgative. That in cases where malaria followed pneumonia, one should not hesitate to push quinine to the extent of 20 grs. per day, even if the pulse and heart action be against its administration. That spleen retracts and becomes less painful under the action of quinine. I may here mention that this man was given liniment chloroform mixed with an equal quantity of lin. saponis to be rubbed over his chest, and his chest was wrapped in cotton-wool in the absence of flannels. Quinine has also an antiseptic effect, and this effect continues after the administration of calomel.

Yours, etc.,

KERSHAW D. KHAMBATTA, D.P.H.

Deputy Sanitary Commissioner in Sind.

## THERAPEUTIC NOTICES.

MESSRS. ELLIOTT & SONS, Little Barnet, Herts, England, send us a useful pamphlet on improvements in X-ray plates and apparatus, which we commend to the attention of workers with X-rays. The Barnet X-ray plate has a high reputation.

WE desire to call attention to the many useful appliances for medical and surgical use made by MESSRS. J. G. INGRAM & SON, LTD., of London. They are of genuine British manufacture. We may mention the *Agrippa* Band test and valve for bottles, their well-known *Eclipse* Hot-water Bottles with patent rubber screw stopper, the *Utilema* Enema, their *Whirling Spray* and their aseptic bed sheetings deserve to be widely known.

THE attention of our readers may profitably be directed to the illustrated catalogue sent out by MESSRS. K.V. DHENGLE & SONS, Byculla, Bombay, manufacturers of hospital steel furniture. Many of the War hospitals in Bombay, Secunderabad, etc., have patronised this firm and have expressed their approval.

THE ever-growing employment of bacteriological methods in medical and surgical treatment calls for increased facilities for the application of bacteriological technique in connection with the sick and wounded in the present war. The necessity of providing some means of applying bacteriological tests in emergency conditions has led Mr. Henry S. Wellcome, the founder of the Wellcome Bureau of Scientific Research and of several other scientific research institutions, to present to the War Office, for the use of the British Army Medical Department, a completely equipped motor bacteriological laboratory.

The formal presentation of the laboratory to the War Office has just taken place. There were present Brigadier-General Sir H. C. L. Holden, K.C.B., F.R.S., from the Ministry of Munitions, also Lieut. Colonel G. B. Stanistreet, C.M.G., Assistant Director-General, A. M. S., and Major Smallman, representing the War Office. Deputy Surgeon-General D. J. P. McNab of the Admiralty, Surgeon-General Sir M. W. H. Russell, K.C.M.G., A.M.S., of the War Office, and Sir Frederick Treves, Bart., C.C.V.O., wrote referring in appreciative terms to this handsome and useful gift.

## Service Notes.

DR. JOHN E. CHAMARETTE, formerly of the Nizam's Army died on 3rd January, 1918, at Hyderabad, aged 90. He served in the Nizam's forces for forty years, and retired 22 years ago.

LIEUTENANT-COLONEL ALEXANDER LEONARD DUKE, Bengal Medical Service, died at Quetta on 27th February, 1918, aged 51. He was born on 12th October, 1866, and educated at Aberdeen University, where he graduated as M.B. and C.M. in 1888. Twenty years later, in 1908, he took the degree of B.Sc. in Public Health at Edinburgh. Entering the I.M.S. as Surgeon on 30th September, 1889, he became Major on 30th September, 1901, and Lieutenant-Colonel on 30th September, 1909. After spending his first six years of service in military employ, he entered the Political Department as Surgeon to the Agency at Meshad, in Persia, where he spent the next eight years. In April, 1904, he was appointed Civil Surgeon of Quetta and transferred to the same post at Bikanir in March, 1908, and at Peshawar in May, 1909; and in December, 1910, was appointed Agency Surgeon and Administrative Medical Officer in Baluchistan. He received the Order of the Izzat-i-Afghanistan in 1907. He was a younger brother of Sir William Duke, K.C.S.I., late acting Governor of Bengal, and now a member of the Secretary of State's India Council.

COLONEL JAMES CAMPBELL MORGAN, Army Medical Service, died suddenly of heart disease in London, during the air raid on the night of 7th March, 1918, aged 53. He was born on 18th July, 1864, the eldest son of the late Colonel Sir Alexander Morgan, K.C.B., educated at the London Hospital, and took the M.R.C.S. and L.R.C.P. London in 1886, also the D.P.H. London in 1901. After acting as House Surgeon at the London Hospital, he entered the R.A.M.C. as Surgeon on 5th February, 1887, became Major on 5th February, 1889, Lieutenant-Colonel on 30th August, 1911, and full Colonel on 1st March, 1915, and was placed on half pay on account of ill health on 29th September, 1916. He served on the North-West Frontier of India in the Zhob Valley expedition of 1890, and in the Tirah Campaign of 1897-98, when he was mentioned in despatches, in the *London Gazette* of 5th April, 1898, and received the medal with two clasps. For some time he held the post of Medical Officer of the Duke of York's Royal Military School, Chelsea.

CAPTAIN ATUL KRISHNA SINHA, I.M.S., was reported as killed in action, in the casualty list published on 18th January, 1918. He was reported as missing so long ago as 25th August, 1917, before which date his death must have taken place. He was born on 4th August, 1888, and educated at the Calcutta Medical College, graduating as M. B. Calcutta, in 1912, and at University College Hospital, taking the M. R. C. S. and L. R. C. P. London, and also the Cambridge Diploma in Tropical Medicine and Hygiene in 1913, and the M. R. C. P. London, in 1914. Entering the I. M. S. as Lieutenant on 25th July, 1913, he became Captain on 25th July, 1916.

BRIGADIER-GENERAL ARTHUR ANTHONY HOWELL, C.M.G., died suddenly at Blackdown Camp on 15th January, 1918, aged 57. He was the 3rd son of the late Very Revd. David Howell, Dean of St. David's, and was educated at Shrewsbury School and at the London Hospital, taking the M. R. C. S. in 1886; and the L. R. C. P. Edin., in 1891. He was in practice in partnership at Wimplesdon Hill, Blockwood, Surrey, where he was Medical Officer to the Post Office. He had been a member of the Auxiliary Forces for many years past, and attained the rank of Lieutenant-Colonel Commanding the 3rd Territorial (City of London) Battalion of the London Regiment, the Royal Fusiliers, on 8th March, 1910. He was given a Brigade in 1916. He was also a member of the City of London Territorial Force Association. He served in the South African War in the City of London Imperial Volunteers, and received the Queen's medal and four clasps, and the honorary rank of Captain in the Army from 1st December, 1900. In the present war he had twice been mentioned in despatches, and had received the C. M. G., and the Russian Order of St. Anne. He also held the Territorial Decoration.

SURGEON-PROBATIONER L. P. ST. J. STORY, R.N.V.R., was reported as drowned in the casualty list published on 21st January, 1918.

THE number of casualties among officers reported during the fourteen days, 16th to 29th January, 1918, inclusive, was 679, a much smaller number than for a very long time past. The figures would have been even smaller, but for the fact that names are still being reported of officers taken prisoner

at Cambrai on 30th November, two months previously. The figures may be tabulated as follows:—

|               |     |     |     |
|---------------|-----|-----|-----|
| Killed ...    | ... | ... | 176 |
| Died ...      | ... | ... | 23  |
| Wounded ...   | ... | ... | 286 |
| Missing ...   | ... | ... | 38  |
| Prisoners ... | ... | ... | 156 |
| Total,        |     |     | 679 |

The casualties among medical officers, as given below, were only ten, and three of these were several months old. The death was also reported of a medical man serving as a combatant, Brigadier-General A. A. Howell. The names are given below, all, unless otherwise stated, are temporary officers of the R. A. M. C.

*Killed.*—Captain A. K. Sinha, I.M.S.

*Drowned.*—Surgeon-Probationer L. P. H. St. J. Story, R.N.V.R.

*Died.*—Brigadier-General A. A. Howell (T. F.); Captain C. G. Sherlock (R. A. M. C.); Surgeon E. Z. Stirrett (Canadian Navy).

*Wounded.*—Captains J. L. Pearse, T. Martin, T. Stoney (S. R.)

*Prisoners.*—Captains F. M. Walker, M.C.; A. G. Boyce; H. B. Goulding (S. R.)

DR. WILLIAM CARDIFF HOSSACK, Port Health Officer of Calcutta, died in Calcutta on 5th January, 1918. He was the eldest son of Mr. Garden Milne Hossack, of St. Catherine's, Bauff, and was educated at Aberdeen University, where he graduated as M. B. and C. M., with honours, in 1894, and as M. D. in 1898. For the last twenty years he had served in Calcutta, holding the posts of special plague officer, health officer to the Corporation of Calcutta, District Medical Officer, and health officer of the Port of Calcutta. He was the author of a Monograph on "The Rats of Calcutta."

SURGEON ERNEST ZAVITZ STIRRETT, of the Canadian Navy, died at Toronto on 22nd June, 1917. He was educated at Toronto University, and graduated there in 1915. He had served for some time in the R. A. M. C., then as Surgeon on an Allan liner, afterwards on a transport, and finally joined the Canadian Navy, serving as Surgeon in the patrol fleet.

CAPTAIN CHARLES GREGG SHERLOCK, R.A.M.C., died at Bagdad on 14th November, 1917, aged 35. He was the eldest son of Henry Gregg Sherlock, F.R.C.S.I., Professor of Dentistry in the Royal College of Surgeons, Ireland, and was educated at Trinity College, Dublin, where he graduated as M. B., B. Ch., and B. A. O., in 1908. He entered the R. A. M. C. as Lieutenant on 1st August, 1909, and became Captain on 1st February, 1912. He was the first medical officer posted to Dublin University, O. T. C. When the war began he was in India, and went to Mesopotamia in May 1917.

LIEUTENANT-COLONEL WILLIAM HENRY QUICKE, Bombay Medical Service, retired, died in a nursing home at Reigate on 20th January, 1918, aged 59. He was educated at Westminster Hospital, and took the M. R. C. S. and L. S. A. in 1880, also the M. D. of Brussels in 1882, and the F. R. C. S. England, in 1896. After filling the posts of Resident Medical Officer at Queen Charlotte's Lying-in-Hospital, and of Assistant Obstetrics Physician at Westminster Hospital, he entered the I. M. S. as Surgeon on 31st March, 1883, becoming Surgeon-Major in 31st March, 1895, Lieutenant-Colonel on 31st March, 1903, and retiring on 25th April, 1911. He served on the North-West Frontier of India in the Zhoib Expedition of 1884, and was present at the affair at Daulatzai, and in the Burmese War in 1885-86, receiving the medal with a clasp. Most of his service was spent in civil employ in Bombay, where he was acting Port Health Officer in 1888-89, and Civil Surgeon of Kaira from 1890 to 1892. In April 1893 he was appointed Surgeon to the Jamsetji Jijibhoi Hospital in Bombay, and Professor of Anatomy and Curator of the Museum in the Grant Medical College, and in November 1903 became Professor of Surgery and First Surgeon.

THE number of casualties among officers reported during the four-en days, 30th January to 12th February inclusive, was only 564, which appears to be the smallest number published during the past three years. They may be tabulated as follows:—

|               |     |     |     |
|---------------|-----|-----|-----|
| Killed ...    | ... | ... | 213 |
| Died ...      | ... | ... | 16  |
| Wounded ...   | ... | ... | 242 |
| Missing ...   | ... | ... | 46  |
| Prisoners ... | ... | ... | 47  |
| Total         |     |     | 564 |

The number of casualties reported among medical officers was also small, only nine. There were reported, however, the deaths of twelve nurses drowned, mostly in the *Aragon* on 30th December. The names are given below. All, unless otherwise stated, are temporary officers of the R. A. M. C.

*Died of wounds.*—Capt. T. F. Craig.

*Drowned.*—Lieutenants K. H. Bhat (I.M.S.), and C. C. W. Mays; Sisters F. D. Compton, A. Welford, and F. Tindall, and Staff Nurse M. D. Roberts (all Q. A. I. M. N. S. R.); Military Probationer N. Hawley; and Misses C. Ball, W. M. Brown, G. Bytheway, V. Duncanson, F. M. Faithfull, L. Midwood, and H. Rogers (all V.A.D.)

*Died.*—Lieutenant-Colonel J. McCrae, (Canadians), Captain J. F. Palling (Canadians), and Lieutenant P. A. Wedgwood.

*Wounded.*—Captain H. A. Cochrane (Canadians), Staff Nurse L. Morse (Q.A.I.M.N.S.R.)

*Prisoner.*—Captain H. J. Davidson, M.C.

LIEUTENANT-COLONEL JOHN MCCRAE, Canadian Army Medical Corps, died of pneumonia in a general hospital in France, on 28th January, 1918, aged 45. He was the second son of Lieutenant-Colonel David McGrae, Canadian Forces, of Guelph, Canada, and after serving as Second-in-Command of No. 3 (McGill) Canadian General Hospital, had been appointed a consulting physician to the British armies in the field, but had not yet taken up that appointment. He was born at Guelph, Ontario, on 30th November, 1872, and educated at Toronto University, where he graduated as B.A. in 1894, as M. B. in 1898, and as M. D. in 1910. He gained a Fellowship in Biology at Toronto in 1894, and the Governor's Fellowship in Pathology at McGill University, Montreal, in 1899, and was subsequently appointed Lecturer in Pathology, and later Lecturer in Medicine, at McGill. He was physician to the Alexandra Hospital, and Assistant Physician to the Royal Victoria Hospital, Montreal. He was co-author with Professor Adami of a text-book on pathology, and contributed several articles to Osler's and McCrae's *System of Medicine*, the latter author being his elder brother.

He served as a Lieutenant of Artillery in the South African War, then he took part in the actions of Belfast and Lydenburg, and gained the Queen's Medal with three clasps; afterwards he commanded the 16th Battery of Canadian Field Artillery. On 22nd September, 1914, he was appointed Senior Medical Officer of the Canadian Artillery, with the rank of Major, came overseas with that force, and served with it until after the second battle of Ypres, when he joined the McGill General Hospital as Second-in-Command.

He had also made his name during the War as a poet, though he had not written much, his best-known poem being one entitled "In Flanders Fields."

LIEUTENANT PERCY ASHWORTH WEDGWOOD, R.A.M.C., was reported as having died, in the casualty list published on 5th February, 1918. He was educated in Edinburgh, at the University and Royal College of Surgeons Schools, and took the Scottish triple qualification in 1898. After serving as Surgeon on the S. S. *Derbyshire*, he went into practice at Kirby Underdale, Yorkshire. He had only recently taken a temporary commission in the R. A. M. C., and was attached to the Yeomanry.

LIEUTENANT KALYANPUR HARIHAR BHAT, I.M.S., was reported in the casualty list published on 6th February, 1918, as "missing, believed drowned." He was educated at Madras University and at Charing Cross Hospital, took the M. R. C. S. and L. R. C. P. London in 1916, and received a temporary commission as Lieutenant in the I. M. S. on 11th March, 1916.

It has been stated that the transports *Aragon* and *Ormanieh* were torpedoed and sunk in the Mediterranean, the former on 30th December, 1917, with the loss of 610 lives, the latter on 31st December, with the loss of 199 lives; Eight nurses were lost in the *Aragon*. In the casualty lists published on 4th and 6th February, 1918, the names of twelve nurses were reported as drowned; also a number of officers as "drowned," or "missing, believed drowned." The names of the ladies lost were, Sisters A. Welford, F. Tindall, and Reserve; Miss N. Hawley, Military Probationer; and Misses C. Ball, W. M. Brown, G. Bytheway, V. Duncanson, H. Rogers, and L. Midwood, all V. A. D. Sister Florence D'Oyly Compton, Q.A.I.M.N.S.R., was also reported as accidentally drowned at Basra on 15th January, 1918. Miss F. M. Faithfull, V.A.D., was also drowned at Basra on that date. Probably Lieutenant Bhat was lost at the same time. It is said that there were 150 nurses on the *Aragon*, of whom all but eight were saved.

LIEUTENANT CHARLES CECIL WILDMAN MAYS, R.A.M.C., was announced as "missing, believed drowned," in the casualty list published on 9th February, 1918. He was educated at Sheffield Medical School, and took the M. R. C. S. and L. R. C. P. London in 1900. After acting as Assistant Resident Medical Officer of Woolwich Infirmary and as Resident Medical Officer of Ecclesall Union Infirmary, Sheffield, he went into practice at Commonsidge, Sheffield. He had only recently taken a temporary commission in the R. A. M. C.

CAPTAIN J. F. PALLING, Canadian Army Medical Corps, was reported as having died, in the casualty list published on 9th February, 1918.

BRIGADE-SURGEON JOHN LAW, Madras Medical Service, retired, died at Northlands, Guildford, on 6th February, 1918, aged 83. He was the second son of the late Thomas Hooper Law, of Barnstaple, North Devon, and entered the I. M. S. as Assistant Surgeon on 28th May, 1858, becoming Surgeon on 28th May, 1870, and Surgeon-Major on 1st July, 1873, and retiring with a Step of honorary rank, on 1st February, 1882. During the latter part of his career he held the important appointment of Residency Surgeon, Hyderabad.

CAPTAIN THOMAS FORREST CRAIG, R.A.M.C., died on board a hospital ship, of wounds, on 2nd February, 1918. He was the second son of the late Revd. A. M. Craig, of Kelso, and was educated at Edinburgh University, where he graduated as M. B. and Ch.B. in 1910, afterwards acting as House Surgeon of the Whitehaven and West Cumberland Infirmary. He took a temporary commission in the R. A. M. C. rather over a year ago.

SURGEON-GENERAL SIR ADAM SCOTT REID, K.C.B., Bengal Medical Service, retired, died of pneumonia in a nursing home in London on 2nd February, 1918, aged 69. He was born on 4th April, 1848, educated at Edinburgh University, where he graduated as M. B. and Ch.B. in 1869, and entered the I. M. S. as Assistant Surgeon on 30th March, 1872, becoming Surgeon on 1st July, 1873, Surgeon-Major on 31st March, 1884, Surgeon Lieutenant-Colonel on 31st March, 1892, Brigade Surgeon Lieutenant-Colonel on 9th June, 1897, full Colonel on 19th May, 1899, and Surgeon-General on 16th June, 1902, retiring on 25th March, 1907. He served in Afghanistan in 1879-80 (medal); in the Chin-Lushai campaign on the North-east frontier of India in 1889-90, with the Burma column (medal and clasp); and on the North-west frontier of India in 1897-98, when he took part in the relief and defence of the Malakund, in the relief of Chakdara, and in the operations in Bajour and in the Mohmand country, was mentioned in despatches, in G. G. O. No. 178 of 1898, and received the medal with two clasps. On his promotion to the administrative grade he was posted as Administrative Medical Officer and Sanitary Commissioner of the Central Provinces, and during his tenure of that post initiated and presided over a conference on malaria at Nagpur in 1901. In February 1902 he was appointed Inspector-General of Civil Hospitals in the Punjab, and on June 16th, 1902, Surgeon-General of the Punjab Command, 'holding that post till his retirement. His whole service was spent in military employment, except the period spent as a Civil Administrative Officer, from May 1899 to June 1902. He was granted a good service pension on 2nd December, 1901, got the C. B. on 25th June, 1903, and was promoted to K. C. B. on 23rd June, 1911.

THE number of casualties among officers reported during the fourteen days, 13th to 26th February, 1918, inclusive, was smaller than ever, being only 448. Things have recently been very quiet on the Western front, and casualties from the recent advance in Palestine have not yet begun to come in. There will be plenty of casualties when the expected is great offensive on the West develops. In the meantime, it is noticeable that the number reported as killed is almost equal to that of the wounded. The casualties may be tabulated as follows:—

|           |     |     |     |
|-----------|-----|-----|-----|
| Killed    | ... | ... | 167 |
| Died      | ... | ... | 11  |
| Wounded   | ... | ... | 170 |
| Missing   | ... | ... | 24  |
| Prisoners | ... | ... | 76  |
| TOTAL     |     |     | 448 |

The number of medical casualties was also very small, only six. The names are as follows:—

*Killed*.—Surgeon-Probationer D. J. Whittton (R. N. V. R.).  
*Died*.—Colonel F. M. Sandwith, R.A.M.C. (temporary); Major W. ap S. J. Graham, R.A.M.C. (regular); Staff Surgeon G. R. Mill (R.N.V.R.); and Captain P. H. Delamore, R.A.M.C. (temporary).

*Wounded*.—Lieutenant P. A. O'Brien, R.A.M.C. (temporary).

STAFF-SURGEON-GEORGE ROBERTSON MILL, R.N.V.R., died on service on 11th February, 1918, aged 37. He was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1901, and as M.D. in 1905. After filling the post of Senior House Surgeon of the Royal Southern Hospital, Liverpool, Honorary Anaesthetist to the Liverpool Dental Hospital, and Honorary Medical Officer of the Birkenhead Maternity Hospital, he went into practice at Birkenhead, where he was Honorary Assistant Medical Officer of the Birkenhead Borough Hospital. He was a member of the Liverpool Medical Institute, and Secretary of the Birkenhead Medical Society. On 8th April, 1909, he joined the Mersey Division of the Royal Naval Volunteer Reserve, and was promoted to Staff-Surgeon last year. In the early part of the war he served on the hospital ship *Reva*, which was recently torpedoed in the Bristol Channel.

SURGEON PROBATIONER DAVID JOHN WHITTON, R.N.V.R., was killed in action on 11th February, 1918, aged 21. He was the only son of William Whittton, and was educated at Kirkcaldy High School and at Edinburgh University, where he was a third-year medical student, when he joined the Navy in August 1917.

CAPTAIN GEORGE STEPHENSON ELLIOTT, M.O. Australian Army Medical Corps, killed on 26th September, 1917, aged 32, was born at West Charlton, Victoria, the son of the late Thomas Elliott of Ballarat, and brother of General H. G. Elliott, of the Australian Imperial Forces. He was educated at Ballarat College, and at Melbourne University, where he gained his blue for athletics and for football, and graduated as M.B. and B.S. in 1915, joining the army immediately after qualifying. After serving for a few months with a field ambulance, he was posted to a battalion, and while serving therewith was killed at Polygon Wood. He had received the Military Cross.

COLONEL FLEMING MANT SANDWITH, Army Medical Service, died at Bournemouth on 17th February, 1918, aged 69. He was the son of Colonel J. W. F. Sandwith, was educated at St. Thomas' Hospital, and took the M.R.C.S. in 1876, the L.R.C.P. London in 1877, also subsequently the M.R.C.P. in 1894, being elected to the Fellowship in 1900, and taking the degree of M.D. Durham in 1893. He served as Surgeon in the National Aid Society's ambulance in the Turko-Servian War of 1876, and to the Stafford House ambulance in the Russo-Turkish War of 1877-78. He went to Egypt when the great cholera epidemic took place there in 1883, and there for many years held the posts of Physician to the Kas-el Ainy Hospital, Cairo, and Professor of Medicine in the Cairo Medical School. In the South African War he served as Senior Physician to the Imperial Yeomanry Hospital. He afterwards settled in London, where he held the post of Gresham Professor of Physic, lecturer in the London School of Tropical Medicine, lecturer on Tropical Medicine at St. Thomas' Hospital, Senior Physician to the Seamen's Hospital at Albert Dock, and Examiner in Tropical Medicine for London and Liverpool Universities, and for the Conjoint Board. In the early part of the war he was Physician to King George's Hospital, London, and in December 1915 was appointed a Consulting Physician to the Forces, with temporary rank as Colonel in the A.M.S. After serving for two years in Egypt he retired on account of ill health. He received the C.M.G. on 1st January, 1916, and was also a Knight of Grace of St. John of Jerusalem, and a member of many medical societies, British and foreign. He was the author of *Egypt as a Winter Resort*, 1889; *The Medical Diseases of Egypt*, 1905; the article on "Pellagra" in the *Encyclopædia Medica*, that upon "Bithargiasis" in Albutt and Rolleston's *System of Medicine*, and in 1914 delivered the Lettsomian lectures, taking as his subject "Dysentery."

CAPTAIN PERCY HERBERT DELAMERE, R.A.M.C., died in the Military Hospital at Milton, Portsmouth, on 25th February, 1918. He was the eldest son of the late Captain P. H. Delamere, 21st Royal Scots Fusiliers, and took the L. R. C. S. I. in 1882, and the L. K. Q. C. P. I. in 1883, after which he entered the Colonial Medical Service, and served in Demerara, British Guiana. After retirement, he took a temporary commission as Lieutenant in the R. A. M. C. on 15th April, 1915, and was promoted to Captain on completion of a year's service.

MAJOR WALTER AP SAMUEL JAMES GRAHAM, R.A.M.C., died on 23rd February, 1918, aged 55. He was born on 1st January, 1863, the eldest son of the late General Sir James Graham, K.C.B., and educated at St. Mary's Hospital, taking the M. R. C. S. and L. R. C. P. London in 1889. After



filling the posts of House Surgeon, House Physician, and Resident Obstetric Officer at St. Mary's, he entered the R. A. M. O. (then the Medical Staff), as Surgeon on 31st January, 1891, and was promoted to Major on 31st January, 1903. He served in the Nile Campaign of 1893, and received the medal, with the Egyptian medal.

DURING 1917 (up to 31st December, 1917), it has been calculated that 74 Honours were granted to the I. M. S., viz., 1 K. C. B., 4 C. B., 1 K. C. M. G., 11 C. M. G., 13 D. S. O., 1 for D. M. C., 11 M. C., 13 Miscellaneous, and 19 Foreign Decorations.

The I. S. M. D. obtained 18, viz., 1 M. C., 11 Miscellaneous, 6 Foreign.

MAJOR A. O. C. WATSON, M.B., C.M., F.R.C.S., R.A.M.C. (Retired), temporary Civil Surgeon, Hoshangabad, is appointed to be Civil Surgeon, Pachmarhi, in addition to his own duties, for the month of April 1918.

LIEUTENANT-COLONEL C. R. STEVENS, F.R.C.S. (Eng.), M.D. (Lond.), I.M.S., and Major D. McCAY, M.D., M.R.C.P., I.M.S., have been elected Fellows of Calcutta University.

LIEUTENANT-COLONEL P. B. HAIG, Indian Medical Service (Bengal), an Agency Surgeon of the 2nd class, is posted as Agency Surgeon in the Eastern States of Rajputana, with effect from the 2nd January, 1918.

COLONEL W. H. B. ROBINSON, C.B., I.M.S., Inspector-General of Civil Hospitals, Central Provinces, is appointed to be Surgeon-General with the Government of Bengal, with effect from the date on which he assumes charge of his duties (11th March, 1918).

THE services of 2nd grade Civil Assistant Surgeon Indra Narayan Sen Gupta are placed temporarily at the disposal of His Excellency the Commander-in-Chief in India, with effect from the afternoon of the 1st February, 1918.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified:—

|                              |     |                      |
|------------------------------|-----|----------------------|
| Indra Narayan Sen Gupta      | ... | 12th February, 1918. |
| Thakurdas Parmanand Vaswani  | ... | 15th February, 1918. |
| Amolak Ram                   | ... | 18th February, 1918. |
| Goviinda Sankaran Tampi      | ... | 22nd February, 1918. |
| Gopalasamudram Sundara Ayyar | ... | ...                  |
| Sankara Ayyar                | ... | 22nd February, 1918. |

THE undermentioned Sub-Assistant Surgeons are temporarily promoted to the rank of Civil Assistant Surgeons, viz:—

1. Senior grade Sub-Assistant Surgeon Sashi Mohan Das.
2. Senior grade Sub-Assistant Surgeon Bishnu Charan Banarji.
3. First grade Sub-Assistant Surgeon Tarak Chandra Datta.

WITH the approval of the Right Hon'ble the Secretary of State for India, the Government of India are pleased to confer a Good Service Pension of £100 per annum on the undermentioned officer:—

From the 1st April, 1915, in the room of Surgeon-General G. F. A. Harris, C.S.I., M.D., F.R.C.P., I.M.S. (Retired), vacated.

Surgeon-General W. R. Edwards, C.B., C.M.G., M.D., I.M.S.

#### Commissions.

Surgeon ranking with Captain, 1st April, 1886.  
Major, 1st April, 1898.  
Lieutenant Colonel, 1st April, 1906.  
Colonel, 25th May, 1914.

#### Appointments.

Arrived in India, 8th October, 1886.  
Attached to 32nd Pioneers, 9th October, 1886, to 11th March, 1887.  
33th Bengal Infantry, 12th March, 1887, to 24th April, 1887.  
7th Bengal Infantry, 25th April, 1887, to 6th February, 1888.  
38th Bengal Infantry, 7th February, 1888, to 6th March, 1889.  
Officiating Civil Surgeon, Nuddia, 7th March, 1889, to 18th March, 1890.  
Resident Surgeon, Eden Hospital, Calcutta, 19th March, 1890, to 20th March, 1891.  
Surgeon to His Excellency the Commander-in-Chief, 21st March, 1891, to 9th April, 1892.  
Civil Surgeon, Quetta, 10th April, 1892, to 1st February, 1900.  
Sent on active service South Africa, 2nd February, 1900, to 1st January, 1901.

Returning from South Africa on Lord Roberts' staff and in England, paid by War Office, 2nd January, 1901, to 9th March, 1901.

Residency Surgeon, Kashmere, 10th March, 1901, to 29th August, 1901.

Special duty, Kashmore, 30th August, 1901, to 29th September, 1901.

Civil Surgeon, Quetta, 30th September, 1901, to 24th October, 1902.

Residency Surgeon, Kashmere, 25th October, 1902, to 25th November, 1910.

Administrative Medical Officer and Agency Surgeon, North-West Frontier Province, 26th November, 1910, to 31st March, 1913.

Military training, Quetta, for one day, 1st April, 1913.

Officiating Inspector-General of Civil Hospitals, Bengal, 2nd April, 1913, to 18th November, 1913.

Military training, Poona, 6th Division, 19th November, 1913, to 26th January, 1914.

Chief Medical Officer, North-West Frontier Province, 27th January, 1914, to 30th April, 1914.

Assistant Director of Medical Services, Kohat Brigade, 1st May, 1914, to 8th September, 1914.

Assistant Director of Medical Services, Derajat and Bannu Brigades, 9th September, 1914, to 23rd March, 1915.

In transit, 24th March, 1915, to 31st March, 1915.

Surgeon-General with the Government of Bengal, 1st April, 1915, to 31st December, 1917.

#### War Services and Rewards.

South African War, 1899-1900. Operations in Cape Colony, March 1900. Operations in the Orange Free State, April 1900. Operations in the Transvaal, May and June 1901, including actions near Johannesburg and Diamond Hill (11th and 12th June). Operations in the Transvaal, East of Pretoria, July to 29th November, 1900, including action at Belfast (26th and 27th August). Despatches *London Gazette*, 16th April, 1901. Queen's Medal with 5 clasps. C.M.G. Companion of the Order of the Bath, 22nd June, 1914.

IN exercise of the power conferred by clause (a) of section 4 of the Bengal Medical Act, 1914 (Bengal Act VI of 1914), the Governor in Council is pleased to nominate Colonel W. H. B. Robinson, C.B., I.M.S., Surgeon-General with the Government of Bengal, to be President of the Bengal Council of Medical Registration, *vice* the Hon'ble Lieutenant-Colonel W. J. Buchanan, C.I.E., M.D., I.M.S., resigned.

IN exercise of the power conferred by article 3 of the Statutes of the Bengal State Medical Faculty, the Governor in Council is pleased to appoint Lieutenant-Colonel C. R. Stevens, M.D., F.R.C.S., I.M.S., to be a member of the Governing Body of the said Faculty, *vice* Lieutenant-Colonel R. Bird, M.V.O., C.I.E., M.D., F.R.C.S., V.H.S., I.M.S. (deceased).

IN exercise of the power conferred by article 3 of the Statutes of the Bengal State Medical Faculty (published with the Resolution of the Bengal Government, No. 2545 Medl., dated the 11th August, 1914, at pages 1553-1562 of Part I of the *Calcutta Gazette* of the 12th idem), the Governor in Council is pleased to appoint Surgn. Genl. W. H. B. Robinson, C.B., I.M.S., to be President of the Governing Body of the said Faculty, *vice* the Hon'ble the Surgeon-General W. R. Edwards, C.B., C.M.G., M.D., I.M.S., resigned.

LIEUTENANT-COLONEL C. R. M. GREEN, F.R.C.S., I.M.S., has succeeded Colonel W. H. P. Robinson, C.B., I.M.S., as Inspector-General of Prisons, Central Provinces.

To the now lengthy list of I.M.S. Honours we are glad to record the grant of the D. S. O. (*London Gazette*, 7th February) to Lieutenant-Colonel T. B. Kelly, I.M.S., Major (temp. Lieutenant-Colonel) F. P. Connor, F.R.C.S., I.M.S.; Major (actg. Lieutenant Colonel) C. G. Gourlay and Major E. A. Roberts, I.M.S. The Military Cross has been awarded to Captain H. L. Battra, Captain M. Dass, Captain P. K. Gilroy; and Lieutenant W. P. Hogg, I.M.S.  
To be Brevet Lieutenant-Colonel—Major W. H. Hamilton, D.S.O., F.R.C.S., I.M.S.; Major J. C. H. Leicester, F.R.C.S., I.M.S.; and Major W. H. Leonard, I.M.S.  
To be Brevet Major—Captain G. G. James, I.M.S.; Captain J. A. S. Phillips, I.M.S.

SANCTION is accorded to the grant of charge allowances to officers in medical charge of Indian Convalescent Sections and Camps in India at the following rates:—

| Sections and Camps accommodating— | Rs.             |
|-----------------------------------|-----------------|
| 3,000 convalescents and over      | 240 per mensem. |
| 2,000 to 2,999                    | 180             |
| 1,000 to 1,999                    | 120             |
| 500 to 999                        | 60              |



Those allowances will be admissible in addition to the rates of pay authorised for officers of the Indian Medical Service in Army Department letter No. 5688, dated the 21st April, 1917.

2. The orders in this instruction have retrospective effect from the date of the opening of the Indian Convalescent Sections or Camps, or from the date on which the accommodation provided reached a total of 500, i.e., the minimum number for which charge allowance is admissible.

\* Army Department No. 11,8802, dated 27th October, 1916.

Army Instruction (India) No. 76, dated 28th January, 1918.

Army Instruction (India) No. 128, dated 12th February, 1918.

Army Department letter No. 11,4598, dated 29th May, 1918.

IN addition to the concessions sanctioned in the communications noted in the margin,\* it has been decided that private practitioners and retired men of the sub-assistant surgeon class, who undertake liability for general service, shall receive a special allowance of Rs. 50 per mensem as sanctioned for 3rd and 4th grade civil sub-assistant surgeons.

With the approval of the Right Hon'ble the Secretary of State for India, the Government of India have decided to grant temporary commissions in the Indian Medical Service, during the period of the present war, to civil sub-assistant surgeons in possession of registrable qualifications on the terms authorised for such officers recruited from other sources, and on the condition that if the qualifications are not registrable in the United Kingdom the officers should be employed out of India only.

It has been decided that the allowance of Rs. 15 or Rs. 10 per mensem authorised under Army Department letter No. 11,4598, Volume I, paragraph 557, for the holder of a commission of the rank of a regiment or that of a detachment, respectively, shall be admissible to a sub-assistant surgeon in temporary medical charge of the depot or a detachment of a Portar, Coolie, or Labour Corps, according to the strength of the depot or the detachment.

2. This decision has effect from the commencement of the war, and the expenses involved, which is debitable to His Majesty's Government, should be passed to the Controller of War Accounts for adjustment.

It has been decided that the principles of Article 487, Civil Service Regulations, shall be followed in calculating the "average pay" and "average monthly pay" referred to in paragraphs 1044(a) (4) and 1000, Army Regulations, India, Volume I, respectively, in connection with the admission of retiring, invalid, wound and injury pensions to sub-assistant surgeons of the Indian Subordinate Medical Department.

It has been decided that a Senior Assistant Surgeon with the honorary rank of Major, when appointed to a position usually held by a commissioned officer holding substantive rank, shall receive consolidated pay at the rate of Rs. 700 per mensem, instead of Rs. 600 as at present authorised.\*

By the death at the end of March of Lieutenant-Colonel Robert Bird, the service loss of one of its most distinguished men. After a brilliant career at St. Bartholomew's he entered the service on 28th July, 1891. He saw no military service but early entered civil employ and was the Resident Medical Officer for many years at the Medical College, Calcutta, with a couple of short intervals as a Civil Surgeon in the Mafanah. In 1904 he was chosen by Lord Curzon to go to Kabul to attend H. M. The Amir of Afghanistan and for his successful and tactful accomplishment of that mission he received the C. I. E., on 1st January, 1905. When His Majesty King George V came out to India in 1911 Lieutenant-Colonel Bird was attached to the staff and received the M. V. O.

For years past he has been the Professor of Surgery at the Calcutta Medical College and enjoyed a large practice. During the year 1917 his health broke down and he had to take leave in December. He attempted to get home but had to go to Wellington where he died on 30th March, 1918, of epithelioma of the intestine.

The undermentioned 2nd class Assistant Surgeon having completed five years' service in that class, to be 1st class Assistant Surgeon, with effect from the 4th March, 1918:—

Henry George Hommings Munrow.

The undermentioned 3rd class Assistant Surgeons having completed five years' service in that class, and passed the

required departmental examination, to be 2nd class Assistant Surgeons, with effect from the 6th March, 1918:—

Charles William Snook Frudrick, Oswald William Edwin Polak, and Maundy Charles Rodgers.

The undermentioned 3rd class Assistant Surgeons having completed five years' service in that class, to be 2nd class Assistant Surgeons, with effect from the 6th March, 1918:—

James Joseph Francis Dunn, Arthur Ernest Mathews, John Henry Addison Martin, William Herbert George Thomas, Anthony Mark Francis Brown, Horace Mullins, and Osborne Halfordton Gale.

The undermentioned 3rd class Sub-Assistant Surgeons having completed five years' service in that class, to be 2nd class Sub-Assistant Surgeons, with effect from the 20th January, 1918:—

Maharaj Shah Khan, Muhammad Salim, and Sunder Singh.

LIEUTENANT-COLONEL C. H. BENSLEY, M.B.E., L.D.S., L.M.S., Inspector-General of Prisons, Central Province, is appointed temporarily to officiate as Inspector-General of Civil Hospitals, Central Province, and to perform the duties of Sanitary Commissioner, in addition to his own duties, *vice* the Hon'ble Colonel W. H. B. Robinson, C.M., L.M.S., gone to Bengal as Surgeon-General.

SUBJECT to His Majesty's approval, Lieutenant-Colonel Daniel Thomas Lane, M.D., is permitted to retire from the service on account of ill health, with effect from the 25th March, 1918.

Lieutenant-Colonel Lane was educated at the vanished Royal University in Ireland and entered the service on 1st October, 1887, and completed 30 years' service for pension on 17th December, 1917. He was put on the retired list, with effect from 1st April, 1915. Lieutenant-Colonel Lane spent most of his time in India in the Punjab, where he was a well-known and highly reputed Civil Surgeon. More recently he was recalled to Military duty and acted as S. M. O. of Indian Troops at Agra. His previous Military Service includes Miranzai (1891), Hazara (1891), Relief of Chitral (1895).

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters, and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage abroad.

## BOOKS, REPORTS, &c., RECEIVED:—

Mouro's Manual of Medicine. Price 18s. Ballière, Tindall & Cox.  
 Green's Manual of Pathology. (12th Ed.) Price 18s. Ballière, Tindall & Cox.  
 Report on Anti-Hookworm Work in Siam.  
 H. Campbell's Biological Aspects of Warfare. Ballière, Tindall & Cox.  
 Moore and Cooper's Field Sanitation. Price 2s. 6d. Ballière, Tindall & Cox.  
 Harrap's and Wolcott's Photographic Record.  
 Darland's Illustrated Medical Dictionary. 5th Ed. W. B. Saunders Co.  
 Modern Hygiene and Public Health. Butterworth & Co., London.

## LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

Col. Jemlage, I.M.S., Poona; Col. Denny, I.M.S., Shillong; Sir L. Rogers, Calcutta; Lt.-Col. Bryson, I.M.S., Madras; Maj. E. D. Thurston, Nepal; Maj. Norman White, I.M.S., Delhi; Dr. E. Novo, Sehengar; Maj. Matson, I.M.S.

## Original Articles.

### THE METAMORPHOSIS AND STANDARDIZATION OF THE L. M. P.

BY R. BRYSON, F.R.C.S.E.,

LIEUT.-COL., I.M.S.

Grub                      Chrysalis                      Moth  
Native Doctor.    Hospital Assistant.    Sub-Assistant Surgeon.

THUS the evolution of the Lepidoptera and the L. M. P. respectively. In the earlier years of my service I was introduced to the latter as the Dresser; the Doctor Babujee, or the Chinna Doctor Dorai and the terms were used with respect and affection. I found him many times and oft a tactful friend and guide.

In a former article to the *Indian Medical Gazette*, I ventured to state "that he corresponds in terms of currency to the nickel anna; the coin that serves the multitude. As is the whole greater than the part, so is the mofussil greater than the city, and if we would talk about the high death-rate of India and methods for reducing it we must remember that it is "quantity" we require in "qualified" men. The millions live in the rural tracts, not in the towns. It is the Sub-Assistant Surgeon who is going to carry succour to the victims of ill-health in India, i.e., the mofussil. M.B.C.M. is quite in his right place in the bigger hospitals, but for many reasons L.M.P. is the man for reducing mortality rates on a large scale."

Our friend is not used to the limelight. I search in vain for any detailed history of his service during the past century. But this war has discovered him, and he can no longer blush unseen for his necessity and utility are now clearly vindicated. In the medical profession he is the proto-type of the rank and file of the army, and which of us in these critical times does not doff his hat to Tommy Atkins? It is my misfortune that I cannot easily lay hands on reliable statistics even as to his strength. However, the roughest estimates are somewhat startling. For instance, I am told that in the Madras Presidency alone the L. M. P. musters over a thousand strong and, again, that three-fifths of the dispensaries and smaller hospitals in this area are run by him. His creation for the benefit of his fellows might be fairly quoted as a shining example of the white man's burden ably borne. Trained and educated entirely by the European in the first instance, he is now licked into shape by a higher grade of his own community (another child of the aforementioned white man) led and directed in most cases by a specially selected I.M.S. Officer. N.B.—The late Sir Pardey Lukis

was at one time Principal of the Agra Medical School.

There must be many interested in the L.M.P., and I feel sure it has occurred to some that now the class has a distinctive title of its own and is admitted to the Medical Register it is time to standardize, slowly but surely, the bearer of the appellation L. M. P. For various reasons there must be, for many many years, a wide difference between the extremes who take shelter under the one umbrella. And it must be the ambition of the service to level up to the highest standard now attained by any school or schools in each and every particular. There must be no retrogression; however long the journey. For example, it will be ages before certain parts of India can afford sufficient midwifery to enable the students to attend so many confinements and conduct so many labours. It will be hard to obtain microscopes for many years and bacteriology must suffer in consequence. But it is certain that a way will be found out of all such difficulties given time and patience and a steady pursuit of a definite goal. To begin with, there is great need for a wider acquaintance with the level that has been attained in each school, and it has struck me that if I placed on paper the position of one school of which I have exact knowledge, it might be useful. We prepared a beautiful syllabus for it, which was printed in 1917 and is sold at an anna a copy, but perusal of such a syllabus is like reading a blue book or the Civil Service Regulations. Much has to be left to the imagination and ingenuity of the reader.

To take the Royapuram School therefore—

The course is a four-year one. In 1916 the rules and regulations were revised and brought up to date, and the course of instruction now runs as follows:—

#### First year.

Elementary Anatomy  
Elementary Physiology  
Chemistry

#### Second year.

Anatomy  
Physiology and Histology.  
Materia Medica

#### Third year.

Medicine  
Surgery  
Pathology  
Hygiene  
Medical Jurisprudence

#### Fourth year.

Medicine  
Surgery  
Midwifery  
Lunacy  
Ophthalmology

Hospital instruction commences in the second year, four months of which is spent in the Out-patient Department. In the third and fourth year he is permitted to walk the Hospital and gets regular clinics in Medicine and Surgery. For this he is divided into batches of seniors and juniors, i.e., fourth and third year, respectively. Practical midwifery is confined to final year men, who have got some notion of hospital etiquette, etc. Each man has to conduct a minimum of 5 labours. Advantage is taken in Madras of the special institutions, for Lunacy, Ophthalmology, Bacteriology and X-Rays,

in each of which the fourth year men is given a course of instruction.

When the new clinical block is built and our own X-Ray and Bacteriological Departments are in working order, it will be unnecessary to send students outside the hospital for instruction in these subjects. The new Out-patient Department, now nearing completion, will afford facilities for Dentistry, Ophthalmology, and work in the nose and throat line amongst that class of patients.

Both third and fourth year men get lectures in anæsthetics, but only seniors are permitted to administer chloroform and that under supervision.

By a recent G. O. both Military and Civil students receive instruction in Company and Stretcher Drill, and each student in this school spends one hour at drill, one day a week, and one hour in the Gymnasium another day.

Hostels are in process of construction for all students in the school. The importance of this from an educational standpoint is gaining rapidly. It is hopeless to expect men to carry on the precepts enjoined in Health lectures if they have to pig it in insanitary slums and never see a clean wholesome lavatory the whole of their college career. The habits acquired at a most impressionable time must influence the rest of their lives and diminish or increase largely their influence for good on their neighbours in future years. The discipline of regular drills and the tone of hostel life under efficient control is an item in moulding the character of these lads which has been far too much neglected and under-estimated in the past.

The strength of the Royapuram School has been fixed at 500 and the students are divided into classes consisting of Military, Civil and Private. The former are stipended, getting Rs. 15 per mensem in the case of Civilians and Rs. 12 in the case of the Military Sub-Assistant Surgeons. Books and tuition are free for both classes. The private men pay Rs. 60 a year for College fees and Rs. 15 for the final examination, and, of course, provide their own books and other paraphernalia.

On qualifying, the Civil Sub-Assistant Surgeon draws a scale of pay ranging from Rs. 50 to Rs. 120. The Military men rather more. Both classes in almost all cases draw extra allowances throughout their service.

An important matter in connection with the training of these men, and one that is bound to vary, is the strength of the staff. With an I.M.S. man or his equivalent as Superintendent, we find at least 12 instructors of not lower standing than the Assistant Surgeon are necessary. Medicine, Surgery, Midwifery and Pathology each require men who are engaged in clinical work, and you cannot combine their subjects under any one teacher. On the other hand, Chemistry, Anatomy

and, perhaps, Physiology require wholetime workers, who should be able to devote themselves to their speciality without the distraction of ward work. An athlete or a man interested in sports is invaluable on the staff, but at present he is a '*rara avis*.' A liberal supply of Sub-Assistant Surgeons as Demonstrators and Assistants has been asked for, but this also depends on the supply available after the war. These are the ideals for which the Royapuram School is striving, and which they are very near attaining if they have not already done so.

A very good index of the work done and the result expected from any body of teachers and pupils is the list of books provided for stipendiaries and recommended to private students. I therefore append a list selected by a Special Committee. They are as follows:—

| Subject.                  | Text-books.  |
|---------------------------|--|
| Anatomy ...               | Cunningham's Manual of Dissections; Gray's Anatomy.  |
| Physiology ...            | Halliburton's Physiology; Schafer's Elements of Practical Histology.   |
| Materia Medica ...        | Hale White.  |
| Surgery ...               | Rose and Carless' Treves' Students' Handbook of Surgical Operations; Minor Surgery and Bandaging by Pollard; Treves' Surgical Anatomy. |
| Medicine ...              | Osler's Medicine; Manson's Tropical Diseases.  |
| Midwifery ...             | Jellott's Manual of Midwifery.   |
| Hygiene ...               | McNally's Sanitary Handbook for India.   |
| Medical Jurisprudence ... | Lyon's Medical Jurisprudence.  |
| Chemistry ...             | Luff and Candy's Chemistry.  |
| Ophthalmology ...         | Swanzy's Diseases of the Eye.  |
| Mental Diseases ...       | Savage's Insanity and Allied Pathology.  |
| Pathology ...             | Green's Pathology; Sims Woodhead's Practical Pathology.  |
| Microscopy ...            | Handbook of Clinical Microscopy by Kesava Pai and Ramachandra Ayyar.   |
| Clinical Medicine         | Hutchison and Rainy's Clinical Methods.  |

Government maintain a medical library for the school and allow a grant of Rs. 500 per annum for replenishing it and keeping it up to date. They also provide some of the current medical journals, and insist on a comfortably furnished reading-room being set apart for the students.

Much time and attention is devoted to the cultivation of sports amongst the boys individually. It is not difficult to pick crack teams of eleven men from four or five hundred, and the Royapuram School has in the last three years brought home two Cups—the "Wilson" and the "Lawley"—won in open competition with University teams such as the Law, Engineering, Medical and others. But intra-mural contests create a sporting spirit amongst a far larger number of men, and at first it was difficult to attain this end.

Advantage was taken of the fact that for several years the school had been in the habit of holding a farewell social to its final-year men. This function was carefully developed. Weeks before, inter-class teams were arranged in almost

every branch of school sports, and the finals were played off in time for a distribution of prizes, at the social, to winning teams in each of the four years. A word about these prizes. Begun on a small scale and provided for by the Superintendent, the staff and the boys, the interest of old boys in their Alma Mater, was gradually roused. Begging for subscriptions outside the school was prohibited, but these men claimed a right to give rewards to their successor. This year nearly all first prizes were given by old students, and we are now beginning to fear an "*Embarras des richesses*." Nothing succeeds like success! In writing on this subject, it would be a want of courtesy not to refer to the keen interest taken in the development of this social side by Government officials and our own chief. Not only was it made possible to secure a full-sized football and hockey ground, to make two cement and two badminton courts, the precursors of four more courts, and a sports pavilion for which estimates have been prepared, but Members of the Executive Council and the Surgeon-General were kind enough to come down and preside in person on different occasions at these farewell socials. As a consequence, the interest engendered in the school in these inter-class competitions is now so keen that I might mention, as an example, the fact that the tug-of-war teams themselves actually enlisted the services of an expert from the police to train them. As a result "Our day" is now "some" function and in preparation for it quite a large number of boys engage in games of an evening. Which was our main objective. I need hardly mention the spirit of *esprit de corps* engendered.

I refer to the subject of examinations at the end for obvious reasons. They are a necessary evil! There are two kinds of examinations, School and Board. Every candidate must obtain a minimum of one-third of the total marks on each subject. Two-thirds of the total aggregate secures a first class.

Board Examinations begin in the first week of March and Re-examinations at the end of June. The results of the latter are communicated by the Board within 7 days of completion of the Re-examinations. Thus, to enable the school to commence in July and end in March.

The rules for the Board are simple. A student either passes, or fails in one or more subjects. In the latter case he is then re-examined, remanded or dismissed. If he fails in one subject he is re-examined, if he fails again he is remanded for a year. If he is already a remanded student he is dismissed. If he fails in two subjects, he is remanded for a year, and if he is already a remanded student he is dismissed. If he fails in more than two subjects he is dismissed. The Board may make special re-

commendations for deviating from these rules in special cases.

The first year examinations are carried out with a very rigid observation of all pains and penalties so as to weed out the hopeless cases, but in the case of 2nd, 3rd and final year men the Board carefully considers their recommendations in consultation with the Superintendents of the schools concerned. Class examinations are held in the school under the same rules, and the students are sifted at these before they are permitted to appear before the Board. No student may appear for the same Board Examination more than three times, and he must take a fresh course after each failure in the subject or subjects failed in, except of course at the re-examinations.

The Board Examiners are chosen from outside the School, the Superintendent and Staff being rigidly excluded from participation. This has some advantages and many disadvantages. The standard of the Examinations is best indicated by the few papers which are appended and the only comparison possible so far has been the case of a fairly average student who appeared last year before the Examiners of the College of Physicians and Surgeons of Bombay a few weeks after passing his final here.

He passed without difficulty, stating that he found the Bombay Examination a very thorough and practical one, and eulogizing the determination of his Examiners to find out all he actually knew of his work.

The following are the papers set at the Board Examinations this year:—

#### FIRST YEAR EXAMINATION. *Elementary Anatomy (Written).*

Monday, the 4th March, 1918. Time 10 A.M. to 1 P.M.

##### 1. Describe—

- (a) The lower extremity of the fibula.
- (b) The second cervical vertebra or axis.

##### 2. Give the origins, insertions and actions of—

- (1) The masseter, (2) The internal oblique muscle of the abdomen, (3) Pectoralis minor, (4) Psoas magnus, (5) Semitendinosus.

##### 3. (a) Describe the elbow-joint.

- (b) What movements are permitted in the joint?
- (c) Name the muscles that take part in each movement.

#### *Chemistry (Written).*

Monday, the 4th March, 1918. Time 2 P.M. to 5 P.M.

- 1. The atomic weight of oxygen is said to be 16. Explain what is meant by that statement.

Explain the following terms and give an example of each:—

- (a) normal solution, (b) acid salt, (c) catalysis, (d) gramme molecular volume.

- 2. In what forms does nitrogen occur in nature? Describe the preparation, properties and reactions of nitrous oxide.

- 3. Give the preparation of the following substances:—(a) Mercuric chloride, (b) marsh gas, (c) acetic acid, (d) hydrocyanic acid, and (e) white arsenic. Write

the equations for the chemical reactions which occur in those preparations (excepting (c)).

4. How does boric acid occur in nature? What are the principal sources of boric acid and how is it obtained from those sources? How can borax be made from boric acid?

5. What are the ores of lead? How is the metal obtained from its principal ore? Mention the oxides of lead. Write a short account of the action of natural waters upon metallic lead.

## SECOND YEAR EXAMINATION.

### Anatomy (Written).

Tuesday, 5th March, 1918. Time 10 A.M. to 1 P.M.

1. Name the structures exposed by the reflection of the gluteus maximus.
2. Describe the left ventricle of the heart.
3. Name the muscles attached to the humerus.
4. Name the cranial nerves, and state by which aperture each leaves the cranial cavity.

### Physiology (Written).

Tuesday, 5th March, 1918. Time 2 P.M. to 5 P.M.

1. Explain how the clotting of blood is caused, and why it does not clot in the vessels during life?
2. What is lymph, where is it formed, how does it differ from the blood, and what are its functions?
3. What are the effects of respiration on the circulation of the blood?
4. Describe, with the aid of a diagram, the structure of an intestinal villus; what are its functions, and how are they performed?
5. Explain how the temperature of the body is regulated (a) during exercise, (b) on a hot day, and (c) on a cold day.

### Materia Medica (Written).

Wednesday, 6th March, 1918. Time 10 A.M. to 1 P.M.

1. (a) What are alkaloids?  
(b) From what sources do you get them?  
(c) Name three, and give their preparations and doses.
2. Write a prescription containing antipyrin, and give the necessary directions.
3. What are hypnotics? Give three examples, with their doses.
4. Name three official confections, and give their composition and doses.
5. Give the therapeutic uses, composition, and doses of—  
(1) Compound ipecacuanha powder.  
(2) Compound lead and opium pill.  
(3) Compound soap pill.  
(4) Fowler's solution.

## THIRD YEAR EXAMINATION.

### Hygiene (Written).

Wednesday, 6th March, 1918. Time 2 P.M. to 5 P.M.

1. Define the following terms:—Hard water, ground air, immunity, endemic, quarantine.
2. Describe the method of disposal of excreta by trenching. When would you prefer it to the wet method of removal?
3. Mention the sanitary conditions you consider necessary in constructing a slaughter-house.
4. What is natural ventilation, and how is it effected?
5. What are the principal impurities found in drinking water, and how do they gain access to it? Mention three common microbial diseases spread by water.

### Pathology.

Thursday, 7th March, 1918. Time 10 A.M. to 1 P.M.

1. Explain the following terms:—Diapedesis, karyogenesis, phagocytosis, hemolysis and caseation.
2. Describe briefly the phenomena that takes place in acute inflammation.
3. What are the different kinds of degeneration you meet with in the body, and where are they commonly found?
4. What is meant by passive congestion? Describe the results it produces.
5. Describe the different kinds of leucocytes—normal and abnormal.

### Medical Jurisprudence (Written).

Thursday, 7th March, 1918. Time 2 P.M. to 5 P.M.

1. If the complete dry skeleton of an unknown adult is brought to you, how would you identify the sex of the deceased?
2. Describe how you would examine (a) a girl who has complained of having been raped, (b) the accused—both being brought to you a few hours after the alleged commission of the offence.
3. Describe how you would treat a person who has fallen into a deep tank and who, on removal from the tank, appears to be dead.
4. Describe the symptoms, treatment, and post-mortem appearances of acute mercuric chloride poisoning.
5. Describe the symptoms and post-mortem appearances observed in poisoning by aconite. How would you treat a severe case?

## FINAL YEAR EXAMINATION.

### Medicine (Written).

Monday, 4th March, 1918. Time 10 A.M. to 1 P.M.

1. Describe the signs and symptoms of acute mania. How would you treat a case?
2. Give the differential diagnosis between smallpox and chickenpox. Give your treatment in smallpox?
3. Describe the etiology, pathology, and signs and symptoms of acute bronchitis.
4. Trace the course of an untreated case of mitral regurgitation.
5. What is acute gastritis? How is it produced? Give its signs, symptoms, and treatment.

### Surgery (Written).

Monday, 4th March, 1918. Time 2 P.M. to 5 P.M.

1. Describe the causes, symptoms and treatment of ulcers of the cornea.
2. A person is brought to you with the history of having been bitten by a dog suspected to be suffering from rabies. What would you do?
3. What are the clinical features, prognosis, and treatment of a chronic (callous) ulcer?
4. What are the symptoms and treatment of stone in the bladder?
5. How would you treat the following cases:—  
(a) Quarter-anna piece impacted in a child's oesophagus.  
(b) A glass bead in a child's ear.  
(c) Inflamed external piles.

### Midwifery (Written).

Tuesday, 5th March 1918. Time 10 A.M. to 1 P.M.

1. Describe the management of a breech presentation, os 1/5 dilated, membranes entire.
2. How would you diagnose placenta prævia? What complications does the condition give rise to?



3. What are the signs and symptoms of pregnancy in the seventh month of gestation?

4. What causes give rise to transverse presentations?

5. What are the signs and symptoms of prolonged labour?

To conclude my article and to return from the special to the general.

The type who addressed one as "ap," as "Huzoor" and "Protector of the poor," appears to be passing away. What little he knew was largely culled from the storehouse of experience. Bitter no doubt in the case of many of his patients, at any rate from their point of view. The up-to-date article is sloughing his skin, and one questions whether in his rapid progress he is not losing some of his good points. Also whether he is not in danger of going too fast. Numbers of representatives, at the importunity of some of whom I have written this article, have asked me why they should not be affiliated to a University. Far be it from me, a F. M. U., to minimise the merit or detract from the reflected glory of association with the Madras or any other University: but lest vaulting ambition o'er-leap itself, may I draw attention to the description I once gave of the Sub-Assistant Surgeon. To quote again from my former article, "It is to my mind only a matter of time that he, the L. M. P., is at length recognised to be what he is, the backbone of the medical profession in India; in matters medical India's one and only hope." To become a caudal appendage must be a retro-grade step to a backbone, and he *can* only hope to come in *behind* the L. M. S. and thus lose his entity. I go to the other extreme and rejoice in the official designation of our college as a school with a "Superintendent," not a "Principal," at its head. I would widen the cleavage between the two and emulate the example of the Royal Colleges, who at Home are absolutely distinct from the Universities, and provide a very much larger number of Doctors than the more expensive Universities can do by themselves. I have yet to meet the graduate of the Madras University who affixes L. M. S. to his M. B., B. S. There is many an M. B. C. M. in Great Britain who is proud to add M. R. C. S., or M. R. C. P., to his University title.

One last word and I have done. The office boy, who is on the lowest rung of the office ladder, is proverbially the recipient of more kicks than ha'pence.

The L. M. P. may without exaggerated effort claim that a huge share of obloquy and criticism are his perquisite. Here are some recent criticisms I have come across. I transcribe them with an object.

"Some specimens I have met of the Sub-Assistant Surgeon are only separated from the beasts that perish by the lack of a tail."

"What is the use of training men to discover malarial parasites under a microscope when they cannot make a poultice." (Why a poultice?)

"Their knowledge (practical) of what might be called First Aid was far below the level of that of a policeman in a St. John's Ambulance Competition."

"The present generation of men is not nearly so polished and gentlemanly as the last. They have lost their heads and have much less respect for their teachers."

To continue might be tedious. Then men who made these remarks were if anything kindly disposed towards the class. They spoke from actual experience, and it is up to the L. M. P. to prove that these specimens were pathological. To my younger brother the Sub-Assistant Surgeon I would say, "Prove yourself — make good."

## ON THE IMPORTANCE OF SOME MINOR EYE OPERATIONS.\*

By JAMES N. MACPHAIL, M.D.,

*Mission Hospital, Ramdiah.*

THE importance of operations for cataract and glaucoma is generally recognised, but it seems desirable to emphasise the fact that a great deal of good may be accomplished in this country by eye operations of a very simple and easy nature. For several reasons it is advisable for the surgeon in India to give special attention to eye surgery. For one thing, the need in India, as in all Eastern lands, for the prompt relief of eye disease is very great. Every day cases may be seen of hopeless blindness which might have been prevented had suitable remedies been available at an early stage. For minor eye surgery, and indeed for major as well, a very slender surgical equipment is necessary. The surgeon can carry about the instruments that are really necessary for most eye operations in his pocket; as a rule the operations can be performed without an assistant; and it is a great relief not to have the administration of a general anaesthetic to consider. Then there are few places where there are not abundant opportunities for eye work; patients suffering from eye diseases will travel long distances to a doctor "whose name they have heard," and a very common way they have of showing their appreciation of the benefit they have received is by sending more cases requiring the same treatment. Those, again, who are suffering from the more chronic forms of eye disease choose a time for operation that is convenient for themselves and their relatives. In the villages the agricultural operations are the main things to be considered, and the

\* An Address at the Bengal Branch of the Medical Missionary Association of India, Kalna, 18th February, 1918.

time chosen for going to hospital is, if possible, between the rice-planting and the harvest or, again, between the harvest and the ploughing. In this way it is possible to know beforehand when to expect a rush of patients and to make plans accordingly. At Bamdah, the favourite months for eye operations are Kartik and Phagoon, corresponding roughly to November and February; an additional reason why these months are popular being that the weather then is neither very cold nor very hot and convenient for travelling.

Perhaps the simplest of all eye operations is that of tattooing the cornea for leucomata. This is often to be recommended for other than cosmetic reasons. Light being reflected from a white surface, the retina receives less illumination than it does when that surface has been blackened. Then, when the nebula occupies only part of the cornea which is in front of the pupil, much disturbance of vision is caused by the dispersion of light as it passes through the nebula. It is better to render the nebula opaque by tattooing and so to compel the light to find its way through the clear part of the cornea. In the same way an improvement is often effected by tattooing a nebula that occupies the whole of the pupillary area and making an iridectomy at a suitable place where the cornea is clear. But even if cosmetic grounds are the only ones on which this operation is indicated, these are by no means to be despised. The first case I tattooed was that of a young Hindu wife, who told me her husband had turned her away on account of the white spots on her eyes, and whom a successful operation restored to her home. I once tattooed a small leucoma on the eye of a boy about ten years old. His father, a well-to-do *bania*, carefully examined the result of the operation, and then said to me—"That saves me eight hundred rupees. We were arranging the boy's marriage, and they were putting eight hundred rupees extra on the price of the bride on account of that white spot on my son's eye." I suggested that part at least of the sum saved should be given to me. "Oh no," the father said, "your merit (*pun*) would then be less." Boys and girls are so often brought to have white spots tattooed as a preliminary to matrimony that I once remarked to a young man, whose eye was being tattooed, "I suppose you are thinking of getting married." "No," he replied, "I am married already." "And how did you manage to get a wife when you had an eye like this?" "I exchanged sisters with another man who had an eye like mine."

There are various ways of doing the operation. One is by means of a grooved needle specially made for the purpose; an instrument of a different pattern consists of several needles in a socket; but any needle or an old cataract knife

will serve the purpose. Some surgeons prefer to prick the white surface first and then to rub in the ink. One advantage of this plan is that it is easier to confine the tattooing to the white surface and not to trespass on to the clear cornea. In opacities that are the result of recent ulcers, the central part is often very thin and may very easily be punctured if sufficient care is not taken; but if proper antiseptic precautions have been taken, the puncturing of the thin scar may do good by relieving tension and preventing the formation of a staphyloma. A great many cases of corneal scars which we see in India are due to small-pox, and in many of these cases Hindus refuse to have them tattooed. They are the handmark of the goddess of small-pox—Mataji—and are therefore sacred.

It has just been said that the puncturing of a thin corneal scar may do good, and it may be added that this is practically the operation of paracentesis corneæ, which is another simple operation that often has a good result. The condition in which it is most clearly indicated is in corneal ulcer, for we know that a clean incision often prevents a rupture of the cornea, with prolapse of the iris and other disastrous consequences. There is the condition which Fuchs calls keratocele, where the substance of the cornea has ulcerated away, but Descemet's membrane, still intact, protrudes like a hernia, distended with aqueous fluid. When this is the case, a timely paracentesis, followed by a well-fitting bandage, may often save the eye. Even when there is no localised ulcer but an abraded corneal surface and a distended anterior chamber, with pain, laceration and photophobia, a paracentesis often gives much relief. It may also be performed when the cornea is healthy, but where iritis is causing distension which is both painful and dangerous. Of course if there is hypopyon, paracentesis is all the more clearly indicated. Someone has suggested that apart from the relief of tension, paracentesis promotes healing of the diseased condition by promoting the flow towards the eye of a fresh blood supply with antibodies along with it.

I have had little experience of the actual cautery for corneal ulcers. In one or two cases in which I practised it, it was followed by sloughing of the cornea. This may not have been due to the cautery, but in India we have often to deal with a cornea of very low vitality, and it is possible that the actual cautery may do harm. But there can be no doubt about the good that is often done by pure carbolic acid when applied to a bad corneal ulcer of the serpiginous type. Fluoresceine may be used to map out the ulcer beforehand, but this is seldom necessary. One of the best means of applying the acid is by a burned match, slightly sharpened.

Trachoma is a disease that usually calls for operative in addition to medicinal treatment. The effect of expression is to change a chronic condition into an acute one, which is more amenable to treatment. As a rule, I use Grady's expression forceps instead of Knapp's roller forceps. The former are said to cause less injury to the healthy tissues. After expressing the granules, I apply a one per cent. solution of corrosive sublimate to the raw surface. This is the method advocated by Treacher Collins, who says the corrosive sublimate excites an exudation of polynuclear phagocytes, and this promotes absorption.<sup>(1)</sup> At Home, chloroform is usually considered to be necessary for this operation, but I find it is quite sufficient to inject a few minims of a 2 per cent. solution of eucaine or cocaine into the retrotarsal fold. After the operation the eyes are kept bandaged for two days to lessen the pain, and after that a 2 per cent. solution of silver nitrate is applied daily, replaced sometimes by copper sulphate if there is much thickening of the lids.

There is no disease that is more destructive to the eye than entropion, usually the result of the cicatrization caused by trachoma, and there is no condition where operative treatment, if not too long delayed, gives more immediate relief. The operation I perform is a modification of Artl's, as described a good many years ago in *Medical Missions in India* by Dr. Arthur Neve of Kashmir. It is much simpler than many of the other methods which are in use, but out of more than 800 cases in which I have performed it, I have not seen more than a dozen in which there was recurrence, and this is a disease in which you may expect recurrence if the process of cicatrization is still going on. The operation is to make an incision along the intermarginal space, between the insertion of the cilia and the openings of the Meibomian glands, and then to dissect off a wedge of skin from the eyelid, of varying width, according to the degree of entropion. That has to be overcome, but always leaving sufficient breadth of skin along the margin to hold the stitches by which the opening is closed. One is apt to take too little skin away rather than too much. In one or two cases in which it seemed to me at first that I had removed too much, causing a condition of lagophthalmos or inability to close the eyelids, the lids adjusted themselves to the situation within a few days. The relief which is afforded is all the more immediate, because we do not apply a bandage or any dressing. The wound is simply painted with tincture iodine. In nearly every case of entropion the cornea is in an unhealthy condition, and bandaging may aggravate this. If a little

suppuration occurs in the wound, it rather improves the result by causing a greater degree of contraction. In my experience, operation for entropion is much more often necessary in the upper than in the lower lid. In the latter it is often the result of the entropion of the upper lid and, when that has been rectified, it disappears of itself, or it may be overcome by passing a stitch vertically through the lower lid and tying the ends over a small roll of lint. In more severe cases it is usually sufficient to dissect out a wedge of skin without making the incision in the margin. Occasionally a condition of spastic entropion of the lower lid is found in elderly people as the result of the bandaging after cataract or other operations, and if it does not disappear speedily after the bandage has been removed, it may be advisable to insert a stitch or to overcome the condition by means of a small strip of sticking plaster.

Pterygium is another disease that is always a disfigurement, and which sometimes seriously interferes with vision. I had a case a few days ago in which the patient was practically blind as the result of double pterygium in both eyes. It is a condition much more common and more severe in India than at Home. Very often it is advisable to remove a pterygium as a preliminary to a cataract extraction, otherwise it interferes with the operation; and some authorities say that by exercising traction on the cornea it delays or may even prevent the healing of the wound. In the same way it is sometimes the cause of astigmatism. Some surgeons find it sufficient simply to snip off the growth with a pair of scissors, and for this they have the authority of the late Dr. Hall, of Allahabad, whose little book on *Blindness, Its Treatment and Cure*, written nearly forty years ago, may still be read with profit. But I take Fuchs's word for it that a pterygium treated in this way recurs, and adopt his method of removal, which is very simple. It will be found that at the limbus, where cornea and sclerotic meet, the attachment of the growth is very loose. At this point the pterygium, grasped by a pair of fixation forceps, almost comes away of itself, and very little dissection is needed to separate its apex from the cornea. It is then cut off with a pair of scissors. This leaves a V-shaped wound in the conjunctiva, and the edges of this wound are brought together and united by one or two stitches of fine silk. It is as well to bandage the eye for a day or two to lessen irritation and prevent infection. The stitches may then be removed, or, if left alone, they will usually come away of themselves after a few days.

Chalazion is a condition that calls for no special remark and is easily treated by evacuation and curettement from the conjunctival surface. Foreign

(1) *British Medical Journal*, 2nd October, 1909.

bodies in the cornea are not so often met with in India as in industrial centres at Home, but we do see them occasionally. If a piece of metal is deeply embedded in the cornea and projecting into the anterior chamber, attempts to remove it may drive it further in, and it is often the best plan to pass a keratome through the cornea and prise out the foreign body from within. Among a village population the worst cases of foreign bodies in the eye that I have met with have been due to fragments of bombs that have exploded during marriage processions.

My experience may be exceptional, but I see comparatively very few cases of dacrocystitis. I think the disease must often be of tubercular origin, and is rare in our district because tubercle is rare. In a total of 1,937 eye operations performed last year at Bamdah, there were only two for extirpation of the lachrymal sac.

Iridectomy is an operation that lies on the border line between major and minor. It is sometimes a very difficult operation when the iris has become adherent, but in uncomplicated cases it is very easy and very safe. There are so many cases in which an iridectomy is likely to do good that one of my working rules is, "When in doubt, do an iridectomy." It is, I think, the operation for acute glaucoma, and I am inclined to doubt if a glaucoma that is not benefited by an iridectomy will benefit by any other operation. My experience is that any operation in chronic glaucoma is unsatisfactory, for although by means of it the surgeon may accomplish all he hoped for in reduction of tension and the saving of the slight degree of vision that remains, the patient is nearly always disappointed with the result. Then we meet with an immense number of cases where iridectomy is indicated for opacities of the cornea. Many of these are quite hopeless, but I think the greatest achievements in eye surgery are to be won in this field. *Nil desperandum* should be our motto, and if the surgeon pays no regard to his reputation, but resolves that if the chance of restoring sight is only one in a hundred, the patient should get the benefit of it, he will from time to time be rewarded in getting a satisfactory result in what at first looked like a hopeless case. A few days ago, in trying to do an iridectomy in an almost hopeless case of corneal opacity, I accidentally evacuated a soft cataract, with the result that there was a distinct improvement in sight, although the iridectomy, as an iridectomy, had failed. My own experience confirms what Fuchs says, that the success of an iridectomy depends neither upon its size nor its shape, but upon its position. However small the clear space of cornea may be, if it is accessible to light, it is worth while trying to make a pupil behind it. Remember,

too, that a very little sight is better than none. It is a great relief to a blind person, who was unable to move about, to have enough vision restored to enable him to find his way to the door. I operated on a blind *punkawala* some time ago. The operation seemed to be very unsatisfactory as far as one could judge from inspection; but the patient was by no means ungrateful; he said he could now find his way from the front of the bungalow to the back without any one to lead him and without falling over obstacles on the way. Then it is often a good plan to do an iridectomy in a case of central corneal ulcer. This promotes healing by relieving tension, and it makes provision against the inevitable opacity if the ulcer is at all deep. The same operation is sometimes indicated in cases of recurrent iritis. Partial staphyloma is another condition where an iridectomy may do good in two ways—by providing a new pupil, and by helping the unsightly protuberance to subside. The operation may also be performed as a preliminary to cataract extraction. As a cataract operator I belong to the old order of capsulotomists, and while I fully recognise all that is said in favour of extracting immature cataracts in the capsule, and do the operation—occasionally, yet what I prefer to do with an immature cataract is to perform an iridectomy. This causes a temporary improvement in vision, and it simplifies the subsequent extraction of the cataract. When patients come to have a ripe cataract removed from one eye, I always advise them to have a preliminary iridectomy on the other eye, and occasionally in critical cases, where the patient, for example, has only one eye, and especially if the other eye was lost as the result of operation, and if the patient is very nervous or exceptionally dirty, I revert to the plan that was very much in vogue when I was a medical student thirty years ago of doing the extraction in two stages. As has been said already, it is a very simple operation extracting a cataract from an eye in which a preliminary iridectomy has been done. If you dispense with the use of the cystitome and rupture the capsule with the point of the knife—and why should you not do so?—you do not require to introduce any instrument except the knife into the interior of the eye. Then a man who has had an iridectomy is less likely to suffer from glaucoma—an important consideration in this land where glaucoma is so common. Still another condition in which iridectomy is called for is in some cases of capsular cataract subsequent to extraction. If, as is often the case, the pupil has been displaced upwards and is covered by the upper lid, it may be the best plan to leave it alone and do an iridectomy at a spot where a better optical result may be expected.

# REPORT ON TREATMENT OF THIRTY — LEPERS WITH SODIUM GYNE- CARDATE "A."

BY DR. E. MUIR,

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At the request of Sir Daniel Hamilton, who was interested in a leper asylum in the Maurbhanj State, I undertook the treatment of the lepers there with sodium gynecardate "A," recommended by Sir L. Rogers. Thirty lepers were taken, from some 80 inmates of the asylum, at random.

The following report is made after three months' treatment. I first examined the lepers myself, and then carried on the treatment through Babu Bharat Chunder Dutt, whom I had specially trained in this treatment, and who reported to me week by week on the progress of each patient. The results obtained are largely due to the intelligence and energy with which he carried out my instructions.

I have examined each patient carefully after the three months' treatment, and have endeavoured to show as plainly as possible the changes which have taken place in the patients during that period.

*Method of treatment.*—A three per cent. solution of sodium gynecardate "A" in distilled water, with one per cent. of pure carbolic and one per cent. of sodium citrate, was prepared, and sterilised by boiling in a flask immersed in another vessel containing water. Of this solution, from half a c.c. up to 5 c.c. was given thrice weekly, intravenously. Tablets of the same drug were given by mouth, but it was not always found possible to give these regularly, and as far as I can judge the oral administration made little or no difference.

The dosage given in each case is shown separately. The principle adopted was to begin with  $\frac{1}{2}$  c.c. and increase the dose by  $\frac{1}{2}$  c.c. each time, giving the injections thrice weekly.

If there was any febrile or inflammatory reaction, the dose was not to be increased, and if the reaction was severe the dose was to be reduced by  $\frac{1}{2}$  c.c. and again gradually increased, if found practicable.

Other indications, to reduce the dose or temporarily stop the injections, were dysenteric or diarrhoeic attacks and giddiness or headache. Proceeding on these principles, the treatment was found to be without danger of any serious nature. None of the patients objected to the treatment.

When one of the patients, who was only slightly affected, recovered, after a few injections, and volunteers were asked for to take her place and make up the number, four or five patients came forward at once, and those not selected were much disappointed.

To begin with the injections caused practically no pain, but after the first two months great sensitiveness was produced and the patients were caused some distress. They, however, without exception willingly endured this, being delighted at the returning sensation as a sign of recovery.

*Method of recording results.*—Of the two most striking features of leprosy, anæsthesia and nodular swellings, the former is far the easier to accurately record. The areas affected were accurately pricked out with a pin and the measurements carefully recorded before the treatment began, and again at weekly intervals throughout the three months. Most of these anæsthetic areas were marked out with pure carbolic, which left a mark throughout the treatment and made the record of diminished anæsthesia much easier.

Anæsthetic patches were found on all parts of the body; and were of two varieties: (1) spreading up from the fingers or toes and in many cases affecting the whole forearm and leg, and even the upper arm and thigh; (2) in patches more or less circumscribed on the upper and lower limbs, face, chest, abdomen and back.

Of these two, the latter yields much more rapidly to treatment. In the former, the anæsthesia healed up rapidly till it came to the fingers and toes, and there the progress, especially in long-standing cases, was much less rapid.

Anæsthesia was present in all the patients. There were marked tubercular nodules in 20 cases. The progress of the tubercular nodules is much more difficult to record; but, with one exception, the improvement was marked, the nodules softening, although the redundancy of skin to a large extent remained. In 15 cases photographs of the faces of the patients were taken at the beginning and at the end of the three months, and these can be compared to show the diminution. They do not however show the softening of the nodules, which can only be appreciated by nipping up the skin between the finger and thumb.

*Results of treatment.*—In case XI, the patient after a few injections developed dysenteric diarrhoea and the treatment had to be stopped.

He has however made some improvement, and the treatment is being resumed with care.

In cases II, XIX, and XXX, patients, who had been ill five, four and eighteen years, respectively, they have entirely lost all traces of anæsthesia and the nodular swelling which was found in the last of these has practically disappeared.

Speaking generally, the most rapid progress was recorded in the youngest patients and in those who had been ill for the shortest time; but this latter does not always hold, as the disease may advance more rapidly in some cases than in others.



Many of the patients felt very weak at the end of the three months, but they were extremely cheerful. I have noticed a similar weakness and laziness in other chronic diseases upon recovery, as in kala-azar. This tends to pass off gradually, but the patients should have abundant nourishing food and a good blood tonic.

Although the progress of the patients was examined weekly during the experiments, I have only recorded the first and last examination.

During the treatment, however, we ran short of sodium gynecardate "A," and had to resort to sodium gynecardate for a week.

During that week the progress was not so rapid, even the patients noticing the difference.

The "A" preparation is made, according to Sir L. Roger's instructions, from fatty acids derived from chaulmougra oil, which have a higher melting point than those from which the other preparation is made.

In many patients there is considerable thickening over the elbows and knees, and anaesthesia tends to linger there after surrounding parts have become normal.

All the patients were encouraged to use vigorous massage and rubbing with mustard oil.

I consider it important to follow the above rules with regard to dosage, as the disease may be increased rather than diminished by giving too large doses to begin with. One great advantage of the intravenous method is its comparative painlessness.

Another is that the dosage can be more finely regulated; whereas by intramuscular injections the drug is being absorbed gradually from a number of injections, the effect tends to be cumulative. In intravenous injections the whole dose comes at once into play and is more effective. Towards the end of the three months there was difficulty in getting veins into which to inject the drug. These patients have now, however, been reduced to injections once a week. I have now brought another thirty-four patients under treatment, a third of these being treated with sodium morrhuate, with which Sir L. Rogers has kindly supplied me, and from which I have got good results in some cases in the Kalna hospital.

One case of leprosy, who declared he had suffered from syphilis, was given two injections of neo arseno-buillon. The result was high fever, the breaking down of the eruption which covered his body into inflamed ulcers, and intense agony in his whole body, which prevented sleep for many nights except under morphia. A few injections of sodium gynecardate "A" had an almost magic effect and caused all these symptoms to disappear.

*Explanation of cases.*—Measurements are made on the limbs from proximal to distal. Measurements of patches indicate the greatest length and greatest breadth of patches in inches,

thus  $3 \times 2$  means that the greatest breadth of the patch is 3 inches and the greatest breadth 2 inches. "Normal" in anaesthetic patches indicates that entire sensation has been restored.

"A" indicates anaesthesia and anaesthetic "T" indicates tubercular nodules. In each case the examination of each part as found on January 15th is compared with the result found on April 15th.

CASE I.—Chemi, age 18, years, female, duration 5 years. Right forearm A from 6" below elbow, now only hand affected; Left hand A from 1" above elbow, now only 3 fingers A.

Patches of  $5 \times 4$  on right arm;  $6 \times 2$  on left arm;  $6 \times 2$  on left arm;  $6 \times 6$  on thorax;  $6 \times 4$  on left thigh, have all now disappeared. A on right leg from 6" above knee and on the left from 4" below the knee, were found. The left leg is now normal, and the right leg is normal as far as the ankle.

T on face now soft and swelling almost gone. The first and second toes of the right foot were wanting, and the fingers of both hands were bent. She can hold things now better than before.

CASE II.—Bimla, age 15 years, female, duration 5 years. Patches of A  $5 \times 4$ ,  $6 \times 2$  on upper arms;  $6 \times 6$  on thorax;  $4 \times 3$  on abdomen, are now all normal. Forearms and hands were A, the whole lower extremities were A; these are now normal. The left first toe was wanting.

Symptoms have entirely disappeared in this case. The largest dose given was 4 c.c., but this had to be reduced due to giddiness and headache. She is now able to do a full day's work.

CASE III.—Lali, age 28 years, female. Duration 8 years. Patches of A  $4 \times 3$ ,  $4 \times 4$  on face;  $6 \times 3$ ,  $7 \times 4$  on thorax; these are now normal. The whole arms from the shoulders were A, only the fingers are now affected. The whole lower extremities were A, now only the toes are affected.

There were T on the abdomen, now much reduced. First phalanx of all the fingers had gone. The first left toe and first phalanx of toes of left foot had gone. Patient can hold things better than before.

CASE IV.—Madhab, age 48 years, male. Duration 10 years. This patient has only been treated for 8 weeks, having been substituted for another case. Patches of A  $1 \times 1$ ,  $5 \times 1$  on face;  $5 \times 2$ ,  $8 \times 1$ , on thorax;  $8 \times 1$  on thigh; these are all normal. Right forearm A, now only 2 fingers affected; A from 6" below elbow has diminished by 2". Right leg A from  $6\frac{1}{2}$ " below knee, now only foot A; all left leg A, now 2" less. Fingers of left hand bent. First phalanx of first left toe gone. Voice husky.

CASE V.—Mangli, age 10 years, female. Duration 6 years. A patches  $11 \times 5$ ,  $10 \times 4$  on thighs; A of arms from 6" below shoulder, now only elbows and hands affected. Right leg A from 8" below knee, now normal; left leg from 2" below knee, now only foot. T of face, now practically normal. Fingers of the right hand were bent. Dose of drug had to be decreased, due to swelling of T patches and fever.

CASE VI.—Churamani, age 20 years, female. Duration 10 years. A patches on face  $3 \times 2$ ,  $2 \times 2$ ; on thorax  $5 \times 4$ ; on back  $4 \times 3$ ; these are all now normal.

Right and left arms entire A, now only hands affected; right and left lower extremities entirely affected, now only toes. First phalanx of all the fingers and toes had gone. Patient can now hold things better than before.

CASE VII.—Nanda, age 29 years, male. Duration 8 years. Right arm A from 2" below elbow, only fingers

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GYNECARDATE "A."

BY DR. E. MUIR,  
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CASE I. February 15, 1918.



CASE I. April, 1918.



CASE XXVII. February 15, 1918.



CASE XXVII. April, 1918.



now affected. Whole left lower extremity A, now only the foot. Dose of sod. gyn. "A" had to be reduced from  $4\frac{1}{2}$  c.c., due to fever and diarrhoea.

Slight tubercular nodules on the face are now not noticeable. Fingers of right hand were bent, second phalanx of third right finger gone; all the toes of left foot gone.

CASE VIII.—Kanka, majhi, age 38 years, male. Duration 9 years. A patches,  $9 \times 4$  on left arm;  $7 \times 3\frac{1}{4}$ ,  $4 \times 1\frac{1}{4}$  on legs, now normal. T on face and body generally, now quite soft, but still slight redundancy of skin. Nose had subsided for some years. Sod. gyn. "A" had to be stopped for a week, and then only 1 c.c. given, due to dysentery and weakness. General improvement is much marked in this case.

CASE IX.—Sankara, age 45 years, male. Duration 12 years. A patches  $3 \times 3$  on face,  $13 \times 5$  on thorax, now normal. Whole upper extremities A, now only hands and elbows affected. The whole lumbar region extending down through the whole of the lower extremities A; now only right knee and half right foot and whole left foot affected. T on face now half gone. First phalanx of right fingers had gone, fingers of left hand were bent, all the toes were deformed, and the second toes of both feet gone. Injections had to be reduced from 4 c.c. to  $3\frac{1}{2}$  and 3 c.c., due to the giddiness produced.

CASE X.—Chinta, age 16 years, male. Duration 8 years. A patches,  $1\frac{1}{2} \times \frac{3}{4}$  on right arm;  $6 \times 5\frac{1}{2}$ ,  $5 \times 4\frac{3}{4}$  on back;  $3 \times 2$ ,  $3\frac{1}{4} \times 4$  on thighs; these are all normal. Both legs were A; on the right side only 3 toes and quarter of the foot are now affected, and on the left side the foot and knee. The face was much thickened, but is now nearly normal. The first toe of the left foot was gone. The injections had to be reduced from 4 to 3 c.c., due to giddiness, fever and headache. Patient is rapidly gaining strength.

CASE XI.—Naran, age 50 years, male. Duration 9 years. A patch,  $6 \times 3\frac{1}{4}$  on left arm; A from 6" above ankle on the right side and 8" above ankle on left side. The feet are still anæsthetic. T patches on face and arms are much the same; T on chest is less. Patient could not stand injections. Dysentery developed and left him very weak. He is only slightly improved, and treatment will have to be carried on very carefully.

CASE XII.—Kandru, age 35 years, male. Duration 10 years. A patch on thorax  $4\frac{1}{2} \times 3$ , now normal. Right arm A from 7" below shoulder, left arm from 2" above elbow. Now normal to elbow. Whole lower extremities A; A less by 3" on right thigh and as far as knee on the left side; legs and feet remain the same. Tubercular patches on face, chest and loins are much less. The fingers were slightly bent and the fifth left toe was gone.

This patient has made less progress than all the others, excepting case XI. He stood the injections well, but seems to need a very lengthened period of treatment.

CASE XIII.—Lal Mohan, age 40 years, male. Duration 13 years. A patches,  $2\frac{1}{4} \times 1$ ,  $2\frac{3}{4} \times 2$  on arms;  $8 \times 2\frac{1}{2}$ ,  $5 \times 3\frac{1}{4}$  on thorax;  $4\frac{1}{4} \times 3\frac{3}{4}$  on loins; all now normal. The whole of the upper and lower limbs were A, now only half of each foot remains A. Face was much thickened and hardened. It is now soft, and thickening is much reduced. Injections up to 4 c.c., were given without any trouble.

CASE XIV.—Nadra, age 35 years, male. Duration 7 years. A patches on arms  $3 \times 3$ ,  $3\frac{3}{4} \times 3\frac{1}{4}$ ; on thorax  $13 \times 4$ ; On loins and abdomen  $7\frac{3}{4} \times 7\frac{1}{2}$ ,  $8\frac{3}{4} \times 7\frac{3}{4}$ ; these are now all normal. The whole upper and lower limbs were anæsthetic; on the right upper limb only 4 fingers and 1 finger on right and left sides respectively are A, the right lower extremity is normal and only 3 toes

are A on left side. Skin of face and nipples was hard and thickened; now it is soft and thickness much diminished. Injections had to be reduced from 4 c.c., due to vomiting produced. Right fingers were bent and left toes deformed. Patient can now hold things much better.

CASE XV.—Gnpi, age 55 years, male. Duration 8 years. Patch, of A  $3 \times 2\frac{1}{4}$  on left thigh; now normal. Legs A from 2" above the ankle; now normal. T patches on face, arms, abdomen, thorax, loins. These are now very much improved, though a little swelling is still left. The fifth toe of the right foot had gone. Vomiting was produced by 5 c.c. injection, and dose had to be reduced to 4 c.c.

CASE XVI.—Bhndn, mahatu, age 40 years, male. Duration 14 years. Patches of A,  $3 \times 1\frac{1}{4}$ ,  $3\frac{1}{4} \times 2\frac{1}{2}$  on arms;  $14 \times 8$ ,  $12 \times 7\frac{1}{2}$  on thorax;  $8 \times 7\frac{1}{4}$  on loins; these are now all normal. The right arm was A from 5" below shoulder, and the left from 6" below shoulder; now only the elbow and hand are A. The whole of the lower extremities were affected; now only the feet are A. No tubercular patches. Fingers were slightly bent and toes deformed.

The dosage had to be reduced from  $4\frac{1}{2}$  to  $3\frac{1}{2}$  c.c., due to the general pain following injections.

CASE XVII.—Kusa, bahara, age 24 years, male. Duration 12 years. Patches of A  $8 \times 6\frac{1}{4}$ ,  $7 \times 5$  on abdomen and loins, now normal. A of right arm from 7" below elbow and of left arm from 6" below shoulder, are both now normal; legs A from knee, now only feet affected.

T on face and slightly on body generally, are now practically normal, though slight redundancy of skin remains on face. This patient is a brother of patient No. II.

CASE XVIII.—Samai, majhi, age 55 years, male. Duration 15 years. Patches of anæsthesia  $6 \times 3$  on left arm,  $4\frac{1}{4} \times 2\frac{1}{4}$ ,  $4 \times 2$  on thorax,  $11 \times 3$  on right leg; now normal. The whole right arm was A, now only the hand remains A. The left arm was A from 6" below the elbow, now only the hand remains. The whole left lower limb was A, now only the toes remain A. The right foot was A, and is now normal. The first and second fingers of the right hand were gone, the fingers were all bent, the left first toe gone.

CASE XIX.—Sajan, age 10, years, male. Duration 4 years. Patches of A  $3\frac{3}{4} \times 2$  on left arm;  $2 \times 1\frac{1}{4}$  on thorax;  $7\frac{1}{2} \times 4\frac{1}{4}$ ,  $8 \times 4\frac{1}{4}$  on thighs; the right lower extremity was A from 3" below knee; these are all now normal. This patient lost all his symptoms during the first 4 weeks of treatment.

CASE XX.—Deba, age 25 years, male. Duration 12 years. Patches of A,  $3 \times 2$  on left arm;  $6\frac{1}{4} \times 5\frac{1}{4}$ ,  $7 \times 6$  on abdomen and loins, are now normal. Right arm was A from 4" below shoulder, now only 4 fingers are affected; the left arm was A from 5" below shoulder, now only the fingers are affected. Both the lower extremities had entire A, now 1 toe and 4 toes, respectively, on right and left sides are A.

The face, nipples, umbilicus, were hard and swollen; now they are only slightly thickened. The first phalanx of all the fingers was wanting.

Patient took the injections without any febrile or other marked reaction.

CASE XXI.—Chandra, majhi, age 35 years, male. Duration 6 years. Patch of A,  $8 \times 6$  on right thigh; now normal. Right arm A, from elbow now four fingers only A. Right lower extremity A from 3" below knee; now only 4 toes A. Left leg all A; now only toes. The fingers of the right hand are bent; first phalanx of four fingers of right hand were wanting. Slight fever made

it necessary to reduce 5 c.c. dose of gyn. of sod. "A." to 4 c.c. and later to  $3\frac{1}{2}$  c.c.

CASE XXII.—Budia Singh, age 36 years, male. Duration 10 years. Patches of A,  $2\frac{1}{2} \times 2$ ,  $2\frac{1}{2} \times 1\frac{3}{4}$  on face;  $7\frac{1}{2} \times 4$ ,  $5 \times 4$  on thorax;  $7 \times 6$ ,  $7 \times 4$  on abdomen and loins;  $14 \times 8\frac{1}{2}$ ,  $13 \times 9$  on thighs; these are all now normal. The whole arms and legs were A, now only the fingers and the toes are affected. The first phalanx in each finger was wanting, and the first phalanx in each toe of right foot was wanting.

CASE XXIII.—Chandu, age 38 years, male. Duration 12 years. Patches of A,  $15 \times 5$ ,  $16 \times 4$  on thorax;  $7 \times 6$ ,  $6 \times 6$  on abdomen and loins. The right and left upper and lower extremities were all entirely A; now the fingers on the right upper, one finger on the left upper, and the toes and knees on the lower extremities, are all that are left A.

The face was T, but is now almost normal in appearance and entirely normal to touch.

CASE XXIV.—Bauri, mati, age 25 years, male. Duration 10 years. Patches of A,  $7 \times 3$ ,  $8 \times 6$  on abdomen and loins; are now normal. The upper and lower extremities were entirely anæsthetic; now all that is left is one finger on the left hand A. There were T patches on face, arms, chest, loins, thighs and legs. These are all almost normal in appearance and quite normal to touch. The fifth finger of the left hand was bent. Slight giddiness made it necessary to reduce the dosage from 5 c.c. to 4 c.c.

CASE XXV.—Jitrai, majhi, aged 60 years, male. Duration 12 years. Patches of A,  $12 \times 4$  on the left arm,  $6 \times 4$ ,  $5 \times 5$  on abdomen and loins. These are now all normal, except for two fingers on the left hand. The right arm was A from 5" below elbow; now four fingers have A. The whole right leg was A, now only half the foot. The left leg was A from 4" below the knee, now only three-quarters of the foot is left affected. All the fingers were thickened and bent, and all the toes of the right foot are wanting.

CASE XXVI.—Sirip, age 40 years, male. Duration 8 years. Patch of A  $6 \times 4$  on left leg, now normal. Tubercular patches on face, arms, thighs, legs are all now soft, but some thickening of the skin still persists. The dosage had to be reduced after the 30th injection, due to a wound forming on the thigh.

CASE XXVII.—Ramdhir, age 35 years, male. Duration 6 years. Patches of A  $3 \times 2$ ,  $3 \times 3$  on face;  $5 \times 3$ ,  $5 \times 2$  on thorax;  $5 \times 4$ ,  $6 \times 5$  on abdomen and loins;  $11 \times 4$ ,  $8 \times 4$  on thighs. These are all now normal. The right hand was A, and is now normal. The whole left upper extremity was A, and now only the hand. The right foot was A, and is now normal; the left foot was A from 6" below the knee, and now only three-quarters of the foot is A. The face was affected with T, especially the nose, but the hardness and almost all the thickening are now wanting. The left first toe is wanting. White marks still persist on the body where the former anæsthetic patches were. The dosage had to be reduced from 4 to  $2\frac{1}{2}$  c.c. due to fever, and, later, to weakness. The patient feels extremely well.

CASE XXVIII.—Bhim, aged 56 years, male. Duration 9 years. Patches of A,  $2\frac{1}{2} \times 2$ ,  $2 \times 2$  on face;  $8 \times 4$ ,  $7 \times 4$  on thorax;  $8 \times 7$ ,  $8 \times 6$  on abdomen and loins; these are all now normal. The whole of the upper and lower extremities were A; only the fingers and the feet persist as A. Hard tubercular nodules on the face are now soft, but some swelling still persists. The T on the arms is now normal. Dosage had to be reduced from  $4\frac{1}{2}$  c.c. first due to giddiness and later due to slight weakness. First phalanges of second to fifth fingers of left hand were wanting.

CASE XXIX.—Abinai, age 32 years, male. Duration 8 years. The whole face was anæsthetic, and is now normal. There were patches of A  $10 \times 4$ ,  $6 \times 4$  on thorax, which are now normal. Patches of A  $7 \times 7$ ,  $8 \times 6$  on loins, are now  $3 \times 2$  and  $2 \times 2$ , respectively. The whole of the upper extremities was anæsthetic, now only the elbows and hands. The whole of the lower extremities was A; now only the foot on the right side, and the foot and knee on the left side. The fingers are bent and the toes of the left foot are wanting. The dosage had to be reduced from 4 c.c., due first to fever and, later, to giddiness.

CASE XXX.—Karmi, age 30 years, female. Duration 18 years. Patches of A,  $8 \times 3$  on right arm;  $9 \times 6$  and  $4 \times 2$  on thighs;  $6 \times 4$  and  $3 \times 2$  on legs; are now all normal. Of the tubercular swelling of the face only a slight trace remains. The dosage had to be reduced from  $4\frac{1}{2}$  c.c., due to giddiness; and again from  $3\frac{1}{2}$  c.c., due to a burning sensation in the skin.

### CONCLUSIONS.

I have used *Leprolin* in the treatment of leprosy for some years, and obtained improvement in many cases and the entire disappearance of anæsthetic patches in a few initial cases. The original gynecardate of soda prepared under Sir L. Rogers' instructions gave better results than Leprolin-sod. Gynecardate "A" however has given vastly superior results to either of these.

It seems to me that the results above recorded make it imperative that this treatment should be as widely used as possible.

It is only when one begins to treat leprosy successfully that one realises the commonness of this disease in India.

The Government statistics are entirely misleading. It is common in all classes of the community. Well-to-do people do their best to hide it from their neighbours, so great is the disgrace of being a leper. When a man's neighbour does know he is a leper, the fact is not likely to find its way into Government statistics.

Anæsthetic leprosy is not as a rule recognised as such by the average native of this country until it reaches the stage, after some years, when the fingers and toes begin to become shortened. For the above two reasons, if for no other, one gets little idea of the tremendous frequency of leprosy from any available statistics.

It seems to me that the Leper Asylums over India, of which there are over forty, should have this treatment introduced as soon as men trained specially for this work are available.

These asylums would then be no longer mere refuges, where lepers are kept till they die, but hospitals and dispensaries from which year by year patients would be turned out cured, and fresh patients admitted for treatment, till the disease is stamped out of the country.



| No. of case. | List of Doses.   |
|--------------|--|
| I            | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $3\frac{1}{2} \times 6$ , $3 \times 25$ .   |
| II           | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $3\frac{1}{2} \times 5$ , $3 \times 3$ ; giddiness, headache.   |
| III          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2} \times 4$ , 3, $3\frac{1}{2}$ , $4 \times 11$ , $3\frac{1}{2} \times 16$ , $3 \times 2$ , fever.  |
| IV           | $\frac{1}{2}$ , $1 \times 2$ , $1\frac{1}{2}$ , $2 \times 2$ , $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , $4 \times 17$ .  |
| V            | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $5\frac{1}{2} \times 3$ , $4 \times 2$ , $2 \times 12$ , $2\frac{1}{2} \times 13$ , swelling of face tubercles.   |
| VI           | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , $4 \times 5$ , $3\frac{1}{2} \times 5$ , $2\frac{1}{2}$ , $3 \times 13$ .  |
| VII          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , $2 \times 2$ , $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2} \times 3$ , 5, $4 \times 6$ , $3\frac{1}{2}$ , 0, $3 \times 17$ ; fever, diarrhoea.   |
| VIII         | $\frac{1}{2} \times 2$ , $1\frac{1}{2}$ , $2 \times 2$ , $2\frac{1}{2}$ , 3, $3\frac{1}{2} \times 2$ , $3 \times 2$ , $2\frac{1}{2} \times 3$ , $3 \times 4$ , 1, $1\frac{1}{2} \times 2$ , $0 \times 3$ , $1 \times 2$ , $1\frac{1}{2} \times 2$ , $2 \times 9$ , dysentery, weak, and had to be stopped. |
| IX           | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , $2 \times 2$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$ , $4 \times 2$ , giddiness; $3\frac{1}{2} \times 6$ , $3 \times 21$ .   |
| X            | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$ , $4 \times 2$ , $3\frac{1}{2} \times 6$ , 3, $3\frac{1}{2} \times 3$ , $3 \times 17$ ; giddiness, fever, headache.  |
| XI           | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , $2 \times 4$ , $2\frac{1}{2} \times 2$ , $3 \times 6$ , $3\frac{1}{2}$ , 3, $0 \times 3$ , 1, $0 \times 15$ ; injections had to be stopped, due to dysentery and weakness.   |
| XII          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , $2 \times 2$ , $2\frac{1}{2} \times 3$ , 3, $3\frac{1}{2}$ , $4 \times 6$ , $3\frac{1}{2} \times 6$ , $4 \times 16$ .  |
| XIII         | $\frac{1}{2} \times 3$ , $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2} \times 2$ , $4 \times 25$ .   |
| XIV          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , $3 \times 2$ , $3\frac{1}{2}$ , $4 \times 12$ , vomiting; $3\frac{1}{2} \times 5$ , $4 \times 8$ , $3\frac{1}{2} \times 4$ .   |
| XV           | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , $2 \times 3$ , $2\frac{1}{2} \times 2$ , $3 \times 2$ , $3\frac{1}{2} \times 10$ , $3 \times 18$ .   |
| XVI          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$ , $4 \times 14$ ; pain in body after injections; $3\frac{1}{2} \times 3$ , 4, $3 \times 7$ , $3\frac{1}{2} \times 2$ , 3, $3\frac{1}{2}$ .   |
| XVII         | $\frac{1}{2}$ , $\frac{1}{2}$ , $1 \times 2$ , $1\frac{1}{2}$ , $2 \times 2$ , $2\frac{1}{2} \times 2$ , $3 \times 2$ , $3\frac{1}{2}$ , $3 \times 25$ .   |
| XVIII        | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , $3 \times 3$ , $2\frac{1}{2}$ , 3, $3\frac{1}{2} \times 7$ , $4 \times 12$ , $3\frac{1}{2} \times 7$ , 3, $3\frac{1}{2}$ .   |
| XIX          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2} \times 5$ , 0, $2\frac{1}{2}$ , 1, $2\frac{1}{2}$ , $2 \times 4$ , 1 week stopped as normal; $1\frac{1}{2} \times 2$ , $2 \times 3$ , $2\frac{1}{2} \times 2$ , $2 \times 10$ .   |
| XX           | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2} \times 3$ , 3, $3\frac{1}{2}$ , $4 \times 4$ , $3\frac{1}{2} \times 4$ , $4 \times 21$ .  |
| XXI          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$ , $5 \times 2$ , $4\frac{1}{2} \times 2$ , $4 \times 4$ , $3\frac{1}{2} \times 9$ , $4 \times 3$ , $3\frac{1}{2} \times 8$ .   |
| XXII         | $\frac{1}{2}$ , $1 \times 2$ , $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$ , $4 \times 6$ , $3\frac{1}{2} \times 11$ , $4 \times 11$ .  |
| XXIII        | $\frac{1}{2}$ , 1, $1\frac{1}{2} \times 2$ , $2 \times 2$ , $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , $4 \times 2$ , $3\frac{1}{2} \times 5$ , $4 \times 22$ .  |
| XXIV         | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2} \times 5$ , $8\frac{1}{2} \times 6$ ; giddiness; $4 \times 14$ .  |
| XXV          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2} \times 3$ , $3 \times 2$ , $2\frac{1}{2} \times 6$ , $2 \times 2$ , $2\frac{1}{2}$ , $3 \times 10$ , $2\frac{1}{2} \times 9$ .  |
| XXVI         | $\frac{1}{2}$ , 1, $1\frac{1}{2} \times 2$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2} \times 4$ , $4 \times 9$ , $3\frac{1}{2} \times 7$ , $3 \times 2$ , $2\frac{1}{2} \times 7$ .  |
| XXVII        | $\frac{1}{2}$ , $1 \times 2$ , $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 3, $4 \times 3$ , $3\frac{1}{2}$ , $3 \times 14$ , $2\frac{1}{2}$ , fever; $2\frac{1}{2} \times 5$ , 0, weak; $2\frac{1}{2} \times 3$ .  |
| XXVIII       | $\frac{1}{2}$ , $1\frac{1}{2}$ , $2 \times 2$ , $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , $4 \times 3$ , $4\frac{1}{2}$ , giddiness; $4 \times 2$ , $3\frac{1}{2}$ , $3 \times 9$ , $3\frac{1}{2}$ , weakness; $3 \times 11$ , $3\frac{1}{2}$ , 3.  |
| XXIX         | $\frac{1}{2}$ , 1, $1\frac{1}{2} \times 2$ , $2 \times 2$ , $2\frac{1}{2} \times 3$ , $3\frac{1}{2}$ , $4 \times 4$ , $3\frac{1}{2}$ , $4 \times 5$ , fever; $3\frac{1}{2} \times 5$ , giddiness; $3 \times 7$ , $3\frac{1}{2} \times 3$ , 3.  |
| XXX          | $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2 \times 2$ , $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$ , giddiness; $4 \times 4$ , giddiness; $3\frac{1}{2} \times 10$ , burning sensation; $3 \times 15$ .  |

Note.—The figures indicate the number of cubic centimeters of sod. gyn. "A" solution injected intravenously in successive doses;  $3\frac{1}{2} \times 6$  indicates that  $3\frac{1}{2}$  c.c. was given on 6 successive occasions.

## A CASE OF SYPHILITIC FEVER.

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IN August 1916, I was called in to visit a patient said to be suffering from malarial fever, with the following history and symptoms: The patient was a very stout and flabby individual, aged 29 years, complaining of frequent attacks of fever, at times intermittent and at others remittent, for the past 3 to 6 months; the last previous attack dated one month back and was ushered in with rigor, resembled a typical attack of malaria and was treated with quinine; a week later some swelling and pain were noticed in the right femoral region, and again seeking medical advice was again treated for malaria and given quinine.

On examination, the temperature was  $100^{\circ}$  F. He had a right femoral bubo, which had opened and had left an unhealthy-looking ulcer of the size of a rupee. There was a sinus in the

perineal raphe, just below the scrotum. There were several dark ecchymotic-looking patches over both tibiae, unsymmetrical and larger over left shin, with a history of great irritation on their first appearance, 6 months ago. The tongue was coated and there was some gastro-intestinal irritation, the motions were loose, dark in colour (iron). Urine high coloured, faintly acid reaction, containing a trace of sugar. No albumin; specific gravity  $1030^{\circ}$ . General condition of patient, pale, anæmic, obese, and flabby. No history of a specific infection was obtainable.

*Treatment.*—He was first treated with salicylates, diuretics and diaphoretics, and unguentum iodidi locally to ecchymotic patches. Ulcer treated with iodine and dressing.

Smears of peripheral circulation examined showed no malarial parasites.

The patient was subsequently treated with liq. hydrarg. perchlor. and potassium iodide, but this disagreed, and salicylate of bismuth was substituted with a small dose of Dover's powder at bed-time, which checked the diarrhoea; the bowels remained loose, but had changed to yellowish colour, resembling enteric stools. Chlorine and quinine mixture prescribed caused more violent diarrhoea with passage of some blood and mucus, and was discontinued. Fæces examined microscopically showed no amœbæ or dysenteric bacilli; the temperature continued of irregular and remittent type.

On 8th September, inunction of mercury was started;  $\frac{1}{2}$  drachm of ung. hydrarg. softened with vaseline was rubbed into the axilla and groins at night, the inunction being carried out thoroughly for at least 20 minutes. The bismuth salicylate mixture was continued, to which opium was added, and effectually controlled the diarrhoea.

At no time during the course of his illness did the temperature fall to normal; there were profuse perspirations in the mornings, and the temperature taken in the axilla, after careful drying, registered  $99.6^{\circ}$  F.,  $100.8^{\circ}$  F. or  $101^{\circ}$  F. In the evening it rose to  $102.6$ ,  $102.8$ , and  $103$ . The peripheral blood was frequently examined for malaria, with invariably negative results. I prescribed no quinine except the few grains in the chlorine mixture, which was stopped after a few doses. On the 10th September morning, the patient expressed that he was feeling much better and I then increased the amount of mercurial inunction to one drachm, which caused a marked reduction of the temperature, especially in the evenings. On the 14th September the evening rise was only to  $100^{\circ}$  F. But the patient said he was unable to continue the inunction treatment any longer. Therefore, on the following day, I placed him on small doses of grey powder,  $\frac{1}{2}$  grain, twice a day, combined

with 5 grains pulvis Doverii. The result was most satisfactory. On the second day the temperature fell to normal, and remained so both morning and evening; there was a slight nocturnal rise subsequently, due to a small collection of pus in the perineum owing to the sinus having closed. The small collection of pus was evacuated and the temperature fell to normal and continued to remain so. The treatment was continued intermittently, and he was subsequently placed on iodide of potassium and tonics and the patient made an uninterrupted recovery, and there has been no return of fever or other symptoms.

*Remarks:—*

There was no history of acquired syphilis obtainable, though his father was said to have died of the disease. It is noteworthy that the disease was mistaken for malaria by two medical practitioners and at one period resembled enteric, and that the disease rapidly yielded to Anti-specific treatment. I reported a similar case in the *Indian Medical Gazette* in March, 1902, in a sepoy of the Hyderabad Contingent, which I wrongly diagnosed as malaria at the onset; but that case was of much shorter duration. The present case much more resembles a case recorded by Dr. Sidney Philips in the *British Medical Journal*, 1899, which occurred in a woman. In this case the fever occurred 9 years after primary infection. She had intermittent fever, preceded by rigor and followed by sweating every other day, for 8 months; earlier in her illness the paroxysms occurred daily, but later the fever was identical with tertian malaria. It was mistaken for the latter, and treated with quinine, which had no effect, but when placed on potassium iodide the temperature commenced to fall and reached the normal in a few days.

Pyrexia, due to syphilis, may occur at any time during the secondary and tertiary stages, and almost invariably occurs prior to the outbreak of the secondary rash, and may be intermittent, remittent or continuous. But the most interesting, from a diagnostic point of view, is that, occurring many years after the primary infection, and such a cause of any undiagnosed fever should be borne in mind. Syphilitic fever may be mistaken for:—(1) Malaria, (2) Enteric, (3) Tuberculosis, (4) Septic Inflammation, (5) Rheumatic fever. The above case was firstly mistaken for (1) Malaria, and in some respects resembled (2) Enteric and (4) and (5), Septic Inflammation and Rheumatic fever. Malaria was excluded by the constant absence of the plasmodial parasite in the peripheral blood, and the others by a process of exclusion, absence of classical symptoms, and aggravation of symptoms on trial of appropriate treatment or their effect being trivial or non-effective. Malarial fever is very prevalent in Coorg, and such a case might easily be mis-

taken for that disease. What chiefly directed my diagnosis was firstly the pigmented patches over the shins and the conditions existing in the genital regions and groins, the absence of malarial parasites in the peripheral circulation, after repeated examinations, and the failure of quinine to affect the fever, as the patient himself acknowledged. The history given of the onset of the pigmented patches and their distribution was not at all typical, but I have come across many cases of a like nature, and naturally my mind leaned to a diagnosis of syphilitic fever. I regret I did not take smears from the groin ulcer for microscopical examination for the *Treponema pallidum*, but our bacteriological technique was very elementary at the time, limited to a few old stains, slides, and cover glasses; but an efficient microscope.

In conclusion, I am of opinion that the intramuscular or intravenous injection of Salvarsan or, better, Neo-Salvarsan would be very efficacious in such cases. Neither were available at the time, but I think their use would bring about a speedy cure and should be adopted, especially if the diagnosis is verified by the finding of the *Treponema*.

## SOME NEW PRINCIPLES IN NUTRITION.

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Some twelve years ago I noted the fact that many of my friends and most of the people around me—both young and old—suffered from time to time from lack of vigour or weakness, in spite of the fact that they took an ample supply of good nourishing food to keep up their strength. Whilst others seemed to be in a chronic state of debility, although they were feeding up.

I also noticed that the weight of the individual had no effect whatever in preventing him or her from becoming weak. I found the plump and well nourished were just as susceptible as their leaner brethren to the depressing effects of fatigue toxins, the poison of malaria, and other diseases, as well as the undue retention of waste matter in the intestinal tract.

So by degrees I arrived at the conclusion that weakness or debility is not a manifestation of deficient nutrition, as we understand it to-day, but is the result of imperfect removal of toxins of various kinds from the body.

In consequence of these observations I began to pay very much more attention to the problem of ridding my patients of their toxins, than to the question of supplying them with nourishment during sickness.

Indeed, when appetite is absent I give no food at all, since lack of desire for food is Nature's way of telling us not to put nourishment into a stomach that is, at the time, incapable of properly dealing with it.

I found that milk, Bengers Food, egg-flips, nutrient enemata and other so-called easily digested forms of nourishment, usually given at such times, were harmful, if not positively dangerous. The severity and duration of the disability and its attendant weakness was not lessened, but undoubtedly increased and unduly prolonged, owing to the fact that the system had to eliminate the toxins formed from undigested food material in addition to the toxins of the disease.

Further, some years' experience of the treatment of the sick and ailing on these new lines has convinced me that many of the so-called complications of a disease are largely the result of coaxing or forcing nourishment into an organism that is telling one, as plainly as it can, "For Heaven's sake keep food away from me until my appetite returns. In the meantime I will live on my own tissues."

How long life can be sustained without nourishment of any kind has been shown by the experience of professional fasters, who take care to relieve the intestinal tract of the waste products and poisons which are daily formed there. Copious drinks of water and saline purges, or large enemata, that thoroughly flush out the colon, are the means usually employed.

Dr. Herter tells us, in his well-known book "Lectures on Chemical Pathology," death from inanition is not a possibility until the body has lost at least one-third of its normal weight—until, *e.g.*, the weight has fallen from 12 stones to 8 stones.

In amateur attempts at fasting, death has occurred after a few days or weeks, as the result of not taking proper steps to get rid of the toxins which accumulate in the intestines.

As Dr. Dewey very truly remarks, in his book "The True Science of Living," to waste away and die from lack of food, then, is a matter, not of days but probably of weeks. It is certainly a period far beyond the average time of recovery from acute diseases.

That most of us eat too frequently in the day, when in health, and render ourselves liable to disease, will be obvious when the difference between hunger and appetite is realised. The former is a morbid craving, whereas the latter is a physiological state.

Hunger is made known to us by sinking, empty, gnawing sensations in the stomach, which are sometimes accompanied by faintness and also, possibly, a headache. But this is not an expression of the need of the body for nourishment. It merely shows the degree of active auto-intoxi-

cation in the digestive system. The incontestable proof of this statement is the fact that cleansing of the alimentary tract—by a drink of water or a large saline purge—causes the disappearance of hunger instead of increasing it.

It is true that the taking of food will often relieve the symptoms of hunger. For, as shown by Dr. Guelpa in his book "Auto-Intoxication and Dis-Intoxication," it then serves the function of absorbing and neutralising the toxic material, in the stomach and intestines, which is the cause of hunger.

Hunger may—and often does—call for three, four, or more meals in the day, to relieve the discomfort attached to it. The "Little and Often" theory of eating is a development of the erroneous belief that hunger and appetite are analogous conditions.

Appetite—unlike hunger—is not expressed by weakness, nor discomforting sensations in the stomach or elsewhere. It is a pleasurable feeling, which is sensed by "watering of the mouth"—at the thought, the sight, or the smell of some repair or fuel material that is needed by the body.

Appetite is a signal to us of the fact that the stock of food material available in the blood and lymph is getting low and will require replenishing. So, unless we intend to draw on some of the reserve of food stored in our tissues, the call should be obeyed, sooner or later.

It is obvious, therefore, that before appetite can possibly appear, the stomach must have been completely empty of food for some time, and that physical work of some sort or another should have been indulged in for a number of hours. Naturally, when lying in bed, or doing work of a sedentary kind, very many hours must elapse before appetite can appear.

Two meals a day, the first taken at or about midday, and the other in the evening, will meet the demands of appetite in *all* fully-grown individuals.

When an evening meal is taken, and this is followed by a night of restful sleep, it is quite unlikely that appetite will call for a meal in the morning at the usual modern breakfast hour, let alone the snack—consisting of buttered toast and fruit with, perhaps, a boiled egg—called *chota hazari*, which usually precedes it.

Custom is responsible for these two unnecessary meals. For the conditions that make for appetite are certainly not present.

There is no objection to taking one or two large cups of weak tea in the early morning and again in the afternoon, as the water helps to flush out any harmful, irritating material that may be in the stomach at the time.

Appetite is always absent during some period of all acute illnesses. It is also absent in health when one is angry, excited, or worried, as well as

when fatigued. So to take food at these times is only asking for trouble. It is true food often gets the credit of removing the feeling of tiredness following exercise, whilst in reality the return of strength in these cases is due to the elimination of the fatigue toxins during the rest obtained by sitting down to a meal.

Whenever the taking of food is advisable, attention to the act of eating and appreciation of taste are necessary to excite the strongest flow of gastric juice—Pawlow's appetite juice—into the stomach to meet the food.

Therefore all foods—soft or hard—should be very thoroughly tasted and mixed with saliva before the mass is swallowed. And this much-to-be-desired condition can only be obtained by chewing each mouthful thoroughly.

Regarding the question of diet, generally speaking, eat sparingly of body-building or protein food stuffs (*e.g.*, grains, pulses, nuts, and animal food,) and feed freely on fruits, salads, and properly prepared vegetables. That is to say, vegetables that have not had their valuable food salts boiled out of them.

When more protein is taken than can be digested and assimilated by the individual, the residue forms an excellent culture medium in the colon for the growth and development of harmful germs of various kinds. And an evil-smelling stool is evidence of this mistake. As is well known, a healthy natural motion has little or no unpleasant odour.

The young of man and animals furnish a striking proof of the fact that only a small quantity of protein is required daily. For they not only live, but grow, on milk—a food which contains not more than  $3\frac{1}{2}$  per cent. of protein.

I have myself followed the principles placed before my readers for some eleven years—on manœuvres, hunting, shooting, skiing, etc., etc.,—with nothing but the greatest benefit to my health and strength. I have also persuaded a number of people to adopt my methods, and have thereby rid them of various chronic disorders that had resisted treatment on customary lines.

Amongst the chronic diseases and symptoms I have cured, are cases of Anæmia, Asthma, Angina Pectoris, Bronchitis, Constipation, Nasal and Pharyngeal Catarrh, Colitis, Diabetes, Dyspepsia of various kinds, Dysentery, Gout, High Blood Pressure, Headaches, Hæmorrhoids, Lumbago, Neuritis, Neurasthenia of Toxic Origin, and Sciatica.

The daily practice of systematised movements for increasing and preserving the flexibility of the joints and muscles, as well as the use of respiratory exercises of my own (which are fully described in my little book "Common-sense Breathing and Feeding,) also form part of the treatment.

As these views on nutrition are revolutionary to a degree, I realise that, until a favourable public opinion has been created for their adoption, it is not possible to enforce their practice in Government or Public institutions of any kind.

But with private patients the position is quite different, and a condition of my attendance on the case is a definite promise to follow my advice, and brave certain discomforts that may be present at first.

"He who dreads new remedies, or old methods arranged in a new way, must abide old evils."

## FORGOTTEN PAGES OF JAIL HISTORY.

BY JOHN MULVANY,

LIEUT.-COL., I.M.S.,

*Superintendent of the Alipore Central Jail.*

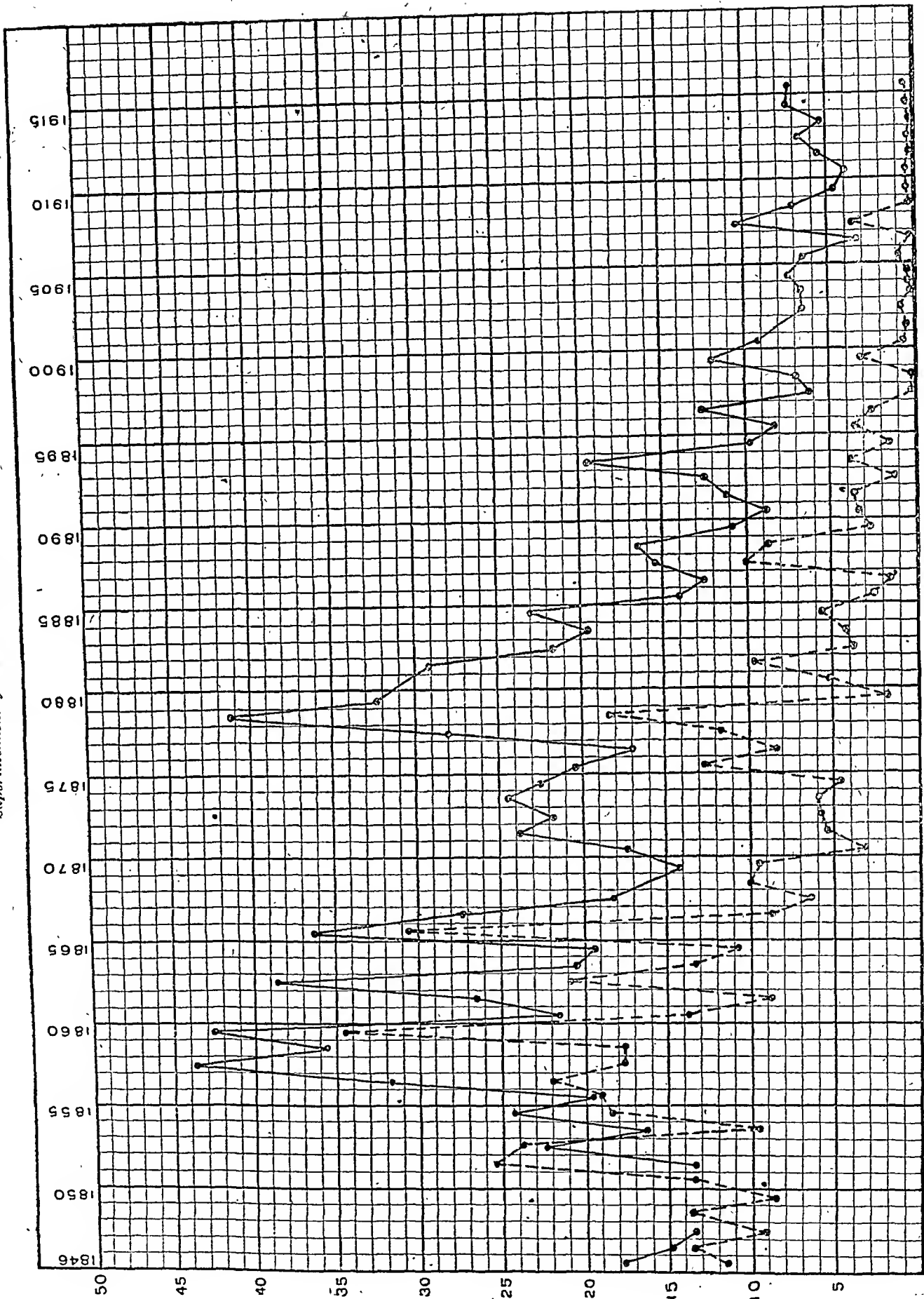
THE bugbear of every prison administration is its pile of skulls, the annual accumulations of which in Bengal were well calculated to carry dismay to the heart of even the most experienced Inspector-General, and Dr. Mouat, on his first appointment in 1855, was as much an amateur in prison work as the politically appointed officials of America or the Commissioners of certain European systems. But he was a capable professional man, endowed with much sound common-sense. And though in matters strictly penological he succumbed to the evil theories of his day, yet, thanks largely to the scarcity of funds—a feature not entirely peculiar to those times,—he was preserved from many of the pitfalls which beset the paths of Western administrators. The problems he had to face were in the main medical and sanitary, but in these he was handicapped by the empiricism and fetichism of the age; sanitary science did not exist; bacteriology was unheard of, and the medical world had not yet divorced itself from an impossible classification of disease, which, by its very nature, obscured the issues at stake and directed investigation away from the proper channels.

One of Dr. Mouat's most noticeable failings was an undue prolixity, which evinced itself in voluminous reports and lengthy appendices. But though this—to us—objectionable feature was doubtless appreciated at its true value by his colleagues and subordinates, yet to it we owe the preservation of many interesting details which a less verbose officer would have thought unworthy of record.

After the profits on jail manufactures, the high mortality was undoubtedly the main object of his solicitude, and he examined it and classified it from every conceivable standpoint. Mortality by age, sex, crime, sentence, occupation, caste, period of incarceration, locality, disease, etc., mortality by mouth, by ear, and by quinquennial; mortality in the light of temperature,

# FORGOTTEN PAGES OF JAIL HISTORY.

By LIEUT.-COL. JOHN MULVANY, I.M.S.,  
*Superintendent of the Alipore Central Jail.*







humidity and atmospheric pressure; of rainfall and direction of the wind, all contributed material to his statistical enquiry. From the records he has left, it would be difficult to point to any avenue of investigation that he did not travel, or to any cause of disease that he did not suspect, except, perhaps, those associated with insanitation and bad water. He did, indeed, grasp the golden key which would have unlocked the door of most of his difficulties, and which he actually embodied in the first Jail Code of 1864, and which runs as follows: "The purification of water may be effected by boiling," but he failed to grasp its significance or to enforce its practice. Indeed, in his official opposition to the rules drawn up by the President of the War Office Sanitary Commission, he went so far as to say, "It is not possible to boil all the water used for drinking in jails, and, if it were, the majority of the Hindu prisoners would not touch it," in reply to the suggestion, "the drinking water, if possible, should be boiled." He also dissented from the statement, "the action of boiling water for ten minutes is believed to be sufficient to destroy any contagious matter adhering to clothes."

It seems not unlikely that Dr. Mouat's attitude was influenced by his scarcely veiled dislike for Mr. Strachey, whose recommendations he seemed to take as a personal reflection on himself; for his whole very voluminous letter to Government is couched in a tone of aggrieved self-defence and endeavours to show how much more he personally knew about epidemic disease than did Mr. Strachey. The following extract is characteristic of the whole: "I trust that I may be pardoned for mentioning that, for some years previous to my appointment to the office I now hold, I was professor of Medicine in the Medical College of Calcutta, and that Hygiene formed one of the subjects carefully taught by me at the end of my course of Practical Medicine. In this matter again I have reason to believe that I am *Primus in Indis* . . . Since 1840 I have seen more or less of every epidemic in Lower Bengal, which is now termed the 'Home of Cholera' . . . I believe, therefore, that I possess as much personal experience of the subject as any living physician, and I am confident that I have nothing to learn on this or any branch of preventive medicine from Sanitary Commissions however constituted." Which shows that even Inspectors-General are human.

He lived, as did his colleagues, in a fog of miasm. Diseases, in those days, were separated into five classes and 23 orders. The classes comprised zymotic, constitutional, local, developmental, and violence diseases; and zymotic diseases were split up into the following five orders: miasmatic, enthetic, dietic and parasitic diseases. Of the 2,404 deaths which occurred in Bengal Jails (there were only 227 in 1917) in the year 1866,

no fewer than 1,883 were placed in the miasmatic order of zymotic disease. Dysentery, diarrhoea, cholera, ague, remittent fever, rheumatism, and even carbuncle, were all miasmatic diseases.

The Appendices for 1868 contain a long report on the outbreaks of cholera for that year. At Meeta-pore (Patna) elaborate meteorological records were kept, and graphically reproduced in the report, but the results were disappointing.

"On the whole (says Dr. Jackson, the Superintendent), the Meteorological Register does not afford much information, with the exception of the barometrical conditions, and I must remark that this is not the first time I have noticed the concurrence of cholera with low atmospheric pressure. I suppose it will be conceded that sporadic, endemic and epidemic cholera are only modifications of the same disease determined by the greater or less activity of the forces which are causative of this disease. These are supposed to be 1st, certain meteorological conditions; 2nd, insufficient clothing, improper or unwholesome food, exposure to heat or damp, especially the former; 3rd, bad sanitation and conservancy, and lastly infection and contagion. The first is in the Creator's hands, and we are absolutely powerless to modify meteorological conditions. The second, especially in jails, is entirely in our hands, and the third should be, and I believe, as I have before stated, that much remains to be done in this direction."

Perhaps it was because the meteorological factors were so elusive that they received so much attention. Immediately after the publication of this report, the Inspector-General issued a special set of rules, one of which enjoined the patrolling of the wards by the Jailor or his Deputy, at least twice every night.

"The second visit should be about an hour before day-break, when the electric tension, pressure of the atmosphere, and temperature are usually at the lowest, and when remission of severe and complicated attacks of fever are, in my opinion, most likely to occur. This is stated by writers of authority, and is consistent with my own observation, to be the time at which attacks of cholera may frequently commence."

One noteworthy conclusion in the Meeta-pore cholera report was the inutility of quarantine, a subject which was then seriously engaging the attention of the Local Government as the result of the Constantinople Conference. Dr. Mouatt was very strongly opposed to quarantine and objected strenuously to its introduction into the jails of Bengal. Dr. Jackson's argument is worth quoting. He says:—

"It is curious to note the occurrence of cholera on the 11th August, after so long an interval as one month and six days, two of the cases having attacked prisoners admitted on the same day and in the same case from Behar, and as the Deputy Magistrate of that Sub-division tells me that cholera was present in and around Behar at the time those prisoners left for Meeta-pore, though not in epidemic form, it must, therefore, have lain dormant for thirty-one days. They could hardly be said to have caught cholera at Meeta-pore, seeing when they were admitted, on the 14th, there had been no cholera for the nine days, and that the first man attacked occupied No. 3 ward, in which no case of cholera had occurred since the 27th April. This is a

strong argument against the utility of quarantine for so short a period as fifteen days: for supposing these two men to have been placed in quarantine for that period, they would still have been in the jail thirteen days at the period they were attacked. The sudden cessation of the disease, with the exception of the one woman attacked after the alarming outburst on the 11th August, is also interesting, and points to anything rather than contagion or infection as the means by which cholera is disseminated."

It would be less than graceful to turn from the cholera records without some mention of the remedies employed. Opinion seems to have been rather strongly divided over the merits of astringents as opposed to purgatives. At Meenapore, the routine treatment was six ounces of castor oil with 30 minims of laudanum, hand-rubbing with ginger, cold water ad libitum, and diuretics when the intestinal discharges had ceased and urine was not secreted. In one case, at least, this heroic treatment was supplemented by calomel, but the patient survived. The death-rate was 26 per cent. At Rajshaye, astringents were used to check the discharges, stimulants during collapse, and diuretics with turpentine to promote the flow of urine. "All preparations of opium were stopped as soon as the cholera declared itself." The mortality there was 64.92 per cent. Throughout the whole province there were 3,234 seizures, with 1,160 deaths.

Dysentery and diarrhoea, which were far greater scourges than cholera, received far less attention than that disease; possibly because controversy did not centre round them so much. Dr. Mouat looked on dysentery as "nearly always a blood disorder, associated more or less with hepatic disease, and with other malarious affections." In another place he says, "The dysentery of Bengal is entirely of a scorbutic type, and greatly due to the defective construction and arrangement of the prisons, together with the Collective System of imprisonment."

Fevers contributed remarkably little to the sickness of Bengal jails, and this was attributed, by Dr. Mouat, to the virtues of the dry-earth system of conservancy, of which he was an ardent exponent. But he believed firmly that malarious fevers became contagious under certain unfavourable conditions, a heresy which a distinguished pathologist of later days did not entirely escape. "The condition necessary to give them a contagious character I hold to have been, most probably, the noxious exhalations from the large amount of putrefying excreta buried in the jail gardens—and this view has not been disproved." He was referring then to the Agra and Pnnjab jail fevers, that were unknown in Bengal; "the very hot-bed of malarious fever." He explained the freedom of Bengal by the fact that "In the Bengal jails all excreta were removed to a distance and there buried—hence the numerous cases of remittent fever of an adynamic type

which occur in some of my jails. have never assumed an infectious character. His contempt for the War Office Commission is again shown in the following extract:—

"I have studied the fevers of Lower Bengal for a quarter of a century, and have treated some hundreds of cases. I have not seen a single case in a native that was not a true marsh fever, although complicated with local inflammations and congestions that altogether masked their characters, and rendered it extremely difficult to detect any remission or intermission for days and, sometimes, weeks. In numerous cases quinine did not abate the symptoms, and could not be borne at all, unless in combination; and in not a few instances, I was compelled to use arsenic, beherine and other remedies, because quinine could never be employed in any form or at any stage of the attack, however well marked the intermissions or remissions were. These are matters that are known to every practitioner of experience, but are of necessity unknown to non-professional enquirers into sanitary matters."

His views on the factors influencing the spread of malaria are interesting in the light of recent controversy:

"I have long been of opinion" (he says) "that the Bengal fever was not due to any mere local causes of disease... My belief is that the natural drainage of a considerable tract of country has been intercepted, from the rising of the beds of the rivers. Its water-supply has become scanty and unwholesome in consequence, and the usual results of this untoward condition have ensued, *viz.*, a rapid disengagement of malaria in a concentrated form, and the poisoning of the people exposed to its influence."

And he advocates—as "absolutely necessary that a fresh and careful survey of the Gauges and Brahmaputra, and of all their affluents and effluents, should be made." Here too he cannot resist a hit at Mr. Strachey, for he says,—

"The theory of the Sanitary Commission is utterly destitute of foundation, and is altogether opposed to the facts of the case as interpreted by those alone who are capable, by professional training, of interpreting them correctly."

When we consider how favourable the insanitary conditions of the overcrowded jails of those days were to the spread of typhus, it seems, at first sight, strange that the disease did not hulk largely in the mortality returns. Is it that the climate and habits of the people, in keeping the body-louse at bay, saved Bengal from the consequences of its own neglect?

Hospital gangrene and sloughing ulcer were unpleasantly in evidence from time to time, but space will not permit more than this passing reference to their existence. But though my article is already unduly long I cannot turn from my ancient records without noting the labours of Dr. Mouat to

"Subject to regular and systematic investigation, the oil of the *Chalmoogra Ordozata* in the treatment of Leprosy and such other diseases of the skin and glandular organs as it is likely to prove useful in." He preferred the oil to the seeds, and recorded how, when it had been used, "In every instance, the progress of destruction had been arrested, the ulcers were all covered with healthy skin, and the general health of the

patients had improved. I have found it of service in discussing scrofulous enlargements of the sub-maxillary and parotid glands, and obtained a fair amount of success from its employment in elephantiasis, and in a mild form of ecthyosis."

The fifteen annual reports issued by Dr. Mouat deal with the most critical period in the history of Bengal jails. They are of interest, not only for the numerous problems they deal with, but because they reveal the absorbing personality of a strong man. Dr. Mouat had his faults. Who has not? He suffered from over self-confidence, and as a consequence was impatient of advice. But he had the virtues of his failings. He knew what he wanted, and always got it in the long run. He made mistakes, many of which were attended with evil and far-reaching consequences. We may feel inclined to smile at his attitude towards, what we now know to be, elementary truths, but we must remember that a future generation will review our work with as much or as little charity as we review his. And then it will be as well if we have to our credit as much as he has. He found chaos. He left order. He built up the present jail department, and endowed it with its first set of rules. He centralised control, and withdrew from the local authorities the powers they had so misused. He wrested the medical control of jails from the Medical Department, and introduced after much opposition the system of Medical Superintendents, to which, with all its faults, Bengal owes so much. He systematized returns and accounts. He started jail gardens, and he perfected throughout the province the dry-earth system of conservancy, which has saved so many lives. In fact, he laid the foundations on which his successors built. And though he was not fated to see the fruition of his labours, he was clear-sighted enough to anticipate the time when the mortality of the province would fall to 30 per thousand. That it has fallen to below 20 per thousand, and will fall still further, is due in no small measure to his labours. And if no tablet has been raised to his memory, yet the mortality chart which was published with the first article,\* is a monument to his honour more lasting than stone, more enduring than marble. Its silent eloquence testifies not only to his greatness, but also to the beneficent results of British rule in India.

## A Mirror of Hospital Practice.

### SURGICAL NOTES.

By S. H. PUGH, M.B.,

South Travancore Medical Mission.

THE following are notes on some of the operations performed in the above hospital in 1917.

\* I. M. G., 1917, p. 355.

During the year, in thirty-one cases the operation of posterior gastro-enterostomy was performed with no mortality. All the cases with, one exception, when they left the hospital, 3 to 4 weeks after operation, were free from their painful symptoms and could eat large quantities of rice without discomfort. It is often difficult to persuade these patients to eat moderately in order not to overtax their digestive powers with the large quantities of food to which they have long been unaccustomed. Almost all the cases gained in weight during their short stay in the hospital after operation, the gains in weight, in pounds, in each case being:—8, 9,  $4\frac{1}{4}$ , 7, 4,  $13\frac{1}{2}$ ,  $3\frac{1}{4}$ ,  $1\frac{1}{4}$ ,  $6\frac{3}{4}$ , 3,  $2\frac{3}{4}$ ,  $\frac{1}{2}$ , 5,  $9\frac{1}{2}$ ,  $7\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $3\frac{1}{2}$ ,  $3\frac{1}{4}$ ,  $3\frac{1}{2}$ ,  $1\frac{1}{4}$ ,  $3\frac{1}{2}$ ,  $1\frac{1}{2}$ ,  $1\frac{3}{4}$ ,  $5\frac{1}{4}$ , 9, and  $1\frac{1}{2}$ . Two patients who did well, ran away before being weighed. Only two patients lost weight, slightly, though they promised to do well. It is surprising that the gain in weight is so often early marked, for of course the patients are on low diet during the first 10 days of the 4 weeks which they remain in hospital. Five of the patients we were fortunate enough to see some months later, when their improved appearance was remarkable. The first patient in 5 months had gained  $27\frac{1}{4}$  lb.; the second,  $26\frac{1}{2}$  lb. in 7 months; the third, 11 lb. in 4 months; the fourth,  $14\frac{1}{4}$  lb. in 6 months, and the fifth,  $9\frac{1}{2}$  lb. in 3 months. The unsuccessful case mentioned above complained of pain over the cardiac end of the stomach before he left the hospital. He has now returned, 11 months later, complaining of tenderness and great pain after food in the same area. There is no tenderness in the region of the anastomosis, pylorus or duodenum. On passing the stomach tube and pouring in a small quantity of fluid to wash out the stomach, a very brisk hæmorrhage started, and the tube had to be immediately withdrawn. There is therefore almost certainly an active ulcer in the cardiac end of the stomach.

It is surprising to find how frequently in Travancore ulceration and cicatricial contraction of the stomach and duodenum in the region of the pylorus occurs. There are now in the hospital no less than 10 patients requiring the operation, some of whom have been waiting in the hospital for the operation over two months. We have hardly ever found signs of ulceration anywhere else in the stomach than within an inch or two of the pylorus.

One patient, a man aged 35 years, was extremely emaciated, weighing only 4 stones  $8\frac{1}{2}$  lb. He was anæmic, and there was œdema of the hands and feet. He gave a history of 12 years, with frequent vomiting and much pain after food in recent years. On examination of the abdomen, there were large peristaltic waves passing from left to, right showing a dilated stomach. The

patient was considered too weak for operation, and was treated medically by washing out the stomach, etc., for a month. He only slightly improved and the operation was undertaken. A large inflammatory mass was found on the posterior wall of the stomach, near the pylorus, and a cicatricial puckering in the anterior wall of the stomach nearer the pylorus. Examination of the gall-bladder showed that it contained several gall-stones. This is interesting, as being the first definite case of gall-stone disease recorded in this hospital. I understand the disease is very rare in many other parts of India. As the patient was so weak, and as the condition of the stomach was sufficient to account for his symptoms, the gall-stones were not removed. He stood the operation well, and in a month was eating large quantities of food with no discomfort. He gained  $3\frac{1}{4}$  lb. before leaving hospital.

It is remarkable how well these weak and emaciated patients bear the operation. Their condition after operation rarely causes anxiety. In none of the thirty-one cases did vomiting occur from the "vicious circle." Only very slight temporary vomiting, due to the anæsthetic, occurred in two or three cases.

The operation consists in making a horizontal isoperistaltic anastomosis 2 inches long on the posterior surface of the stomach as close to the pylorus as room for the anastomosis can be found, or the pathology of the stomach will permit. The only reasons for this arrangement of the anastomosis are that there may be no sharp bend in the afferent loop of the bowel where it joins the stomach, as there is in the case of the vertical anastomosis, and that the outlet of the stomach may be nearer the normal situation.

One case, a boy aged 14 years, suffering from advanced tuberculous disease of the right hip-joint, was admitted. The patient was weak, emaciated, and with a swinging temperature. There were two discharging sinusses on the outer aspect of the joint. The thigh was flexed  $45^\circ$  and adducted. The boy was kept in the open air day and night and placed in a double Thomas's hip-splint. By slowly straightening out one side of the splint the deformity was gradually overcome. As during the next four months the disease was steadily progressing and the boy was obviously going downhill, Kocher's excision of the hip-joint was performed. The head and the whole of the neck, which were badly diseased, were removed. The acetabulum was cleaned out, but owing to the extreme weakness of the patient it was impossible to stay to deal with the rim of the acetabulum thoroughly. The great trochanter was put in the acetabulum, and the patient placed in a Stile's abduction hip-splint. Since the operation the boy has steadily and greatly improved, and has put on much flesh. The temperature is now normal and

the pulse has dropped from 120 to 90. The sinusses have not closed, though the discharge, mostly serous, is very slight. Every 7 days 10 per cent. iodoform and 10 per cent. bismuth subnitrate in vaseline is slowly injected warm into the sinusses.

In nine cases appendicectomy was performed. In all cases of dyspepsia the possibility of old-standing trouble in the appendix is remembered. In several of the cases on operation the appendix has been found almost completely buried in adhesions. Two such patients have required gastro-enterostomy.

One patient was admitted with the usual signs and symptoms of an acute appendicitis. On opening the abdomen, the appendix was normal, but on the anterior surface of the cæcum was found an appendix epiploica, quite black and necrotic. There was very little inflammation in the surrounding peritoneum, and on removal the necrotic tissue was found to be odourless. The most probable explanation of the condition seemed to be that the appendix epiploica had in some way become twisted. The affected tissue was removed, and the patient made a rapid recovery.

A woman was sent to hospital with the diagnosis of appendicitis. The history was that while straining at stool 5 days previously, she suddenly felt very severe pain in lower part of the right side of the abdomen, so that she could hardly stand, and felt faint. On admission pulse 86, temperature  $100^\circ$ . Pain and tenderness in the lower part of the abdomen, which was only slightly distended. On opening the abdomen the appendix was found to be normal, but the abdomen contained a considerable quantity of blood-stained serum, and there was widespread moderate congestion of the peritoneum, and some distension of the bowels. It was then found that the right broad ligament, with the tube and ovary, was twisted, and that the broad ligament, tube, and ovary were black and extremely congested. The parts affected by the volvulus were removed. They were found to be odourless, and were full of blood, from hæmorrhages from the congested vessels. General peritonitis was not anticipated, and the abdomen was closed. There was nothing in the tube, etc., to suggest that the condition was caused by a ruptured ectopic gestation. The morning after the operation the pulse was 78 and temperature normal. In the evening the pulse was 104 and the temperature  $100.5^\circ$ . On the third day the bowels moved well, and there was no distension of the abdomen. She developed jaundice, became steadily worse, developed coma, and died on the 5th day, with a temperature of  $105^\circ$ . The cause of death appears to have been delayed chloroform poisoning. She was treated with large dose of sodium bicarbonate by the mouth and subcutaneously.



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LANCET, Dec. 18th, 1909, p. 1812: "..... The above case is one out of a number of successful results obtained from the use of this remedy (Cryogenine) contrasted with Pyramidon, which certain writers regard as the best drug for phthisical temperature. I think there can be little doubt 'Cryogenine' is the safer and more efficacious antipyretic....."

J. E. G——, M.D.

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**THE BRITISH MEDICAL JOURNAL.**

Sept. 2nd, 1916:—

**Re AMBRINE TREATMENT.**

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26/10/17.

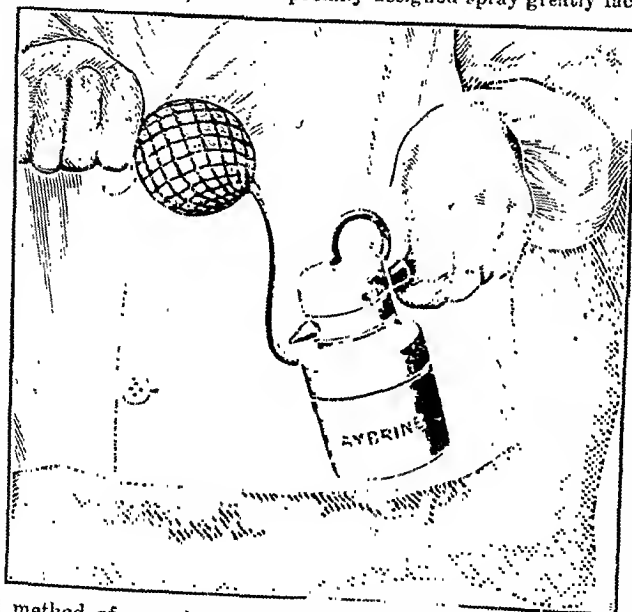
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DEAR SIR,—I thank you for the Ambrine. I found it very effective in a chronic and very painful varicose ulceration of leg.

Please send some more Ambrine, about 5s. worth.

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The most efficient means and method of ensuring active **Hyperthermal Therapy** to the practical treatment of **Burns and Varicose Ulcer, Rheumatism, Gout, Arthritis, Neuralgia, and similar affections.**



**THE LANCET.**

June 10th, 1916:—

**THE VALUE OF AMBRINE IN THE TREATMENT OF WOUNDS.**

"Attention is being drawn to the remarkable success of the Ambrine Wax treatment now being used at the Hôpital St. Nicolas at Issy-les-Moulineaux for burns, frozen feet, and all wounds where the tissues have been so damaged as to exact great length of time and considerable disfigurement in their restitution by the usual means. The Minister of War, in reply to the Deputy M. Mons as to why, in view of the marvellous results obtained by treating burns and frost bites with Ambrine at the Hôpital St. Nicolas, all the soldiers suffering from such wounds were not sent there, stated that this was being done as far as possible. ...."

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By the double action of secretions and peristalsis.

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E——, Scotland, 8th October, 1917.

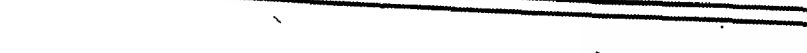
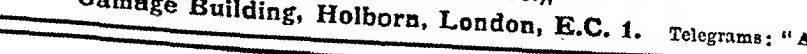
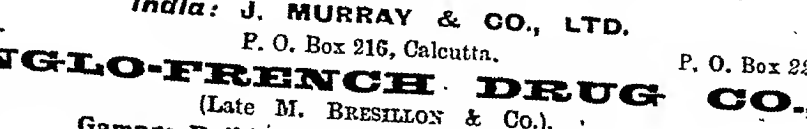
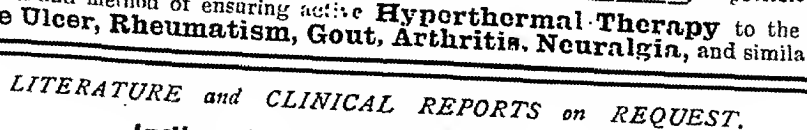
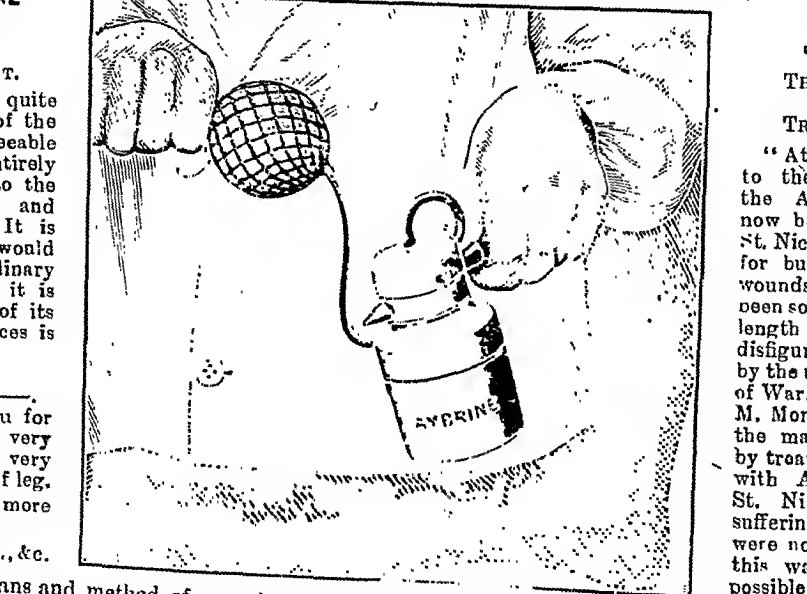
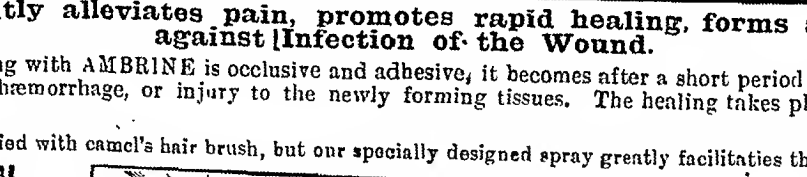
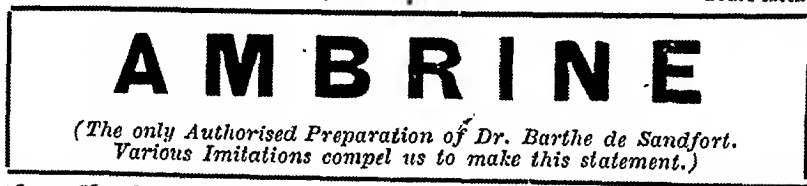
DEAR SIR,—Having derived considerable benefit from the use of Opolaxyl Tablets in my own personal case, I write as a practising physician to ask if you would make any reduction of price in the event of my sending you an order for a fair quantity—say one dozen bottles.

Yours faithfully, M.D.

## AMBRINE

(The only Authorised Preparation of Dr. Barthe de Sandfort.  
Various Imitations compel us to make this statement.)

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Toxicity less than one-sixth.

Therapeutical effects identical with Cocaine (excepting as an exhilarant) for Dental or Surgical, local and Spinal Anæsthesia, Lozenges, Snuffs, Ointments, &c.

## Composition of Neocaine-Surrenine:

|                                     |     |          |
|-------------------------------------|-----|----------|
| Pure Neocaine                       | ... | 5 c.g.   |
| Acid Borate of Adrenalin (Takamine) | ... | 0.1 m.g. |

Pure Neocaine is also supplied.

FORMS.—Powder in capsules and phials. Ready prepared solutions in Ampoules (various percentages), and Ampoules of sterilised liquid for making solutions.

## THE MEDICAL TREATMENT OF CANCER.

# CUPRASE

CUPRASE is a colloidal copper hydroxide which is obtained chemically by the reduction of salts of copper in the presence of albuminous acid.

As a result of over ten years' research work on Cancer, Dr. Gaube du Gers produced a new Colloidal Copper Hydroxide which has given remarkable results in *arresting the progress of the disease*, with loss of pain, and great improvement in the general condition of the patient.

The numerous clinical reports from Doctors of repute in various countries, give cases of a great variety. In a of these pain has been eliminated, and in a Good percentage cures are claimed, and in no instance any undesirable effects.

Its easy application (intramuscular injections) places it within the reach of all practitioners. It is not toxic.

Disappearance of the Pain.

Return of Sleep.

Increase of Appetite.

Colour and Strength.

Supplied in boxes of 8 ampoules.

WARWICKSHIRE, July 1st, 1917.

DEAR SIR,—Will you please send me another box of Cuprase ampoules. The previous lot effected a most remarkable cure in an elderly lady suffering from cervical cancer—the cauliflower-like growth has disappeared with its offensive discharge.

This case was given three months' life by a Specialist, being inoperable.

Yours faithfully,

(Signed) B—B—, M.R.C.S., L.R.C.P.

## ANTITYPHOID

Inoculation by the gastro-intestinal tract



TYPHOID BACILLI

The results of 4,000 applications of **Enterovaccin** carried out by approximately 200 Doctors are as follows:

1. No one who has been treated with **Enterovaccin** has been attacked by typhoid fever.
2. This method of immunisation is without risk.
3. There is no contra-indication.

Enterovaccin is put up in hermetically sealed tins containing 28 spherules, sufficient for a complete treatment (one week). Each spherule contains per milligramme:

300 millions Eberth bacilli. 180 millions coli bacilli. 120 millions paratyphoid bacilli.

# IODEOL

Perfectly tolerated.. Never causes Iodism.

Each capsule contains 4 grains of Colloidal Iodine in the most minute form of subdivision known.

It is administered by  
**INTRAMUSCULAR  
INJECTION**

for  
**Pneumococcal Disease  
—Simple and Infective  
and  
Broncho-Pneumonia.**

**Bronchitis.  
Pulmonary Congestion.  
TUBERCULOSIS, &c.**

**By the Mouth (Capsules):**

**syphilis**, or wherever Iodides are indicated. Iodeol is ten times more active and does not cause Iodism.

**Externally (Liquid):**

Contains 50 per cent. Colloidal Iodine (must not be used for injection), ten times more active than painting with Iodine tincture—does not produce erythema or irritation. Absorption is extremely rapid.

**For Gynaecology (Ovules):**

These are introduced into the vagina, slowly discharge the iodine which penetrates deeply into the vaginal mucous membrane, giving rapid relief from congestion and pain.

Destructive to the micro-organisms.

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Recurrent Fever  
SYPHILIS

# GALYL

Framboesia and  
Sleeping Sickness

Practical work with GALYL in the shape of

**60,000 INTRAVENOUS** (Dilute and Concentrated) and **INTRAMUSCULAR INJECTIONS** administered in Military, Naval and the principal General Hospitals throughout the United Kingdom, has demonstrated that this preparation is **more rapid and less toxic** in action than any compound of the "606" group, which accounts for the **consistently excellent clinical results without any undesirable by-effects.**

## Forms:

FOR INTRAVENOUS INJECTIONS:—  
(1) **DILUTE.**—GALYL is supplied in neutral glass ampoules containing the necessary dose of Sodium Carbonate, sterile distilled water only being used for the dissolution.

(2) **CONCENTRATED.**—A special outfit containing one dose GALYL, one ampoule sterilised solution, and one small filter is supplied.

### Doses:

0.10—0.15—0.20—0.25—0.30—0.35—0.40

(3) FOR INTRAMUSCULAR INJECTIONS:—  
GALYL is supplied in **OILY EMULSION.**

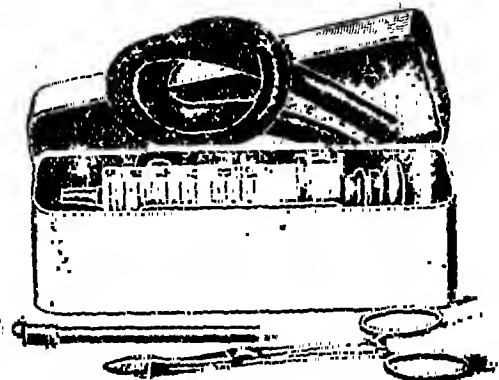
### Doses:

0.10—0.15—0.20—0.30—0.40.

## POCKET CASE.

Containing the entire instruments (sterilizable) necessary for administering a concentrated intravenous injection of GALYL or other solution.

- 1 India-rubber Tube for constricting the arm.
- 1 Clamp for fixing the rubber band.
- 1 Glass Syringe of 10 c.c. capacity.



- 1 Platinum-iridium Needle, length 4 cm., diameter 0.9, with short bevelled joint and special barrel. Attachable to the syringe without any additional junction.
- 1 Nickel-plated Case to hold all the above.
- 1 Chamois Leather Pouch.
- 1 Glass Filtering Tube, with rubber attachment.

Price complete 30/-

## HECTINE

**Formula:** Sodil Benzo-sulpho-p-amniaphenyl arsonas.

Dr. Mouneyrat—the discoverer of Galyl (the well-known and widely adopted French Neo-Salvarsan substitute) and also Hectine, a compound which—though it possesses a very low arsenic percentage and has proved most safe in use—gives remarkably successful clinical results in syphilis and the parasyphilitic affections. Hectine has a record of about one million injections.

Hectine is not only a specific in syphilis, but it acts as a general tonic in the treatment of bloodless and anæmic patients and in all cases where **Arsenic** is indicated.

In malaria it acts as a specific owing to its anti-parasitoid and anti-thermic actions; also in tuberculosis, rachitism, neurasthenia, asthma, chorea, skin diseases, etc., etc.

**Hectine** is supplied in hermetically sealed ampoules for intramuscular injections.

Ampoules A—containing 10 c.g. in 1 c.c.

Ampoules B—containing 20 c.g. in 1 c.c.

Pills (in phials of 24) 10 c.g.

## HECTARGYRE

(Mercurial Salt of Hectine)

Hectargyre being a **double specific** cure syphilis and all its manifestations more rapidly and more surely than any other mercurial preparation.

As a treatment following Galyl, or *ab initio* in all stages of the disease, Hectargyre is very effective and rapid; it is well tolerated even where prolonged treatment is necessary; the most intractable cases of syphilis have yielded highly satisfactory results.

Hectargyre is supplied in sterile ampoules for intramuscular injections.

Ampoules A containing—

Hectine 10 c.g. }  
Hg. 1 c.g. } in 1 c.c.

Ampoules B containing—

Hectine 20 c.g. }  
Hg. 1½ c.g. } in 1 c.c.

Pills containing—

Hectine 10 c.g.  
Protoid of Hg. 1 c.g.  
Opium Extract 1 c.g.  
(In phials of 24 pills.)

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**The Combined Treatment of SYPHILIS.****SUPSALVS****STABLE SUPPOSITORIES OF  
"606" (of French Manufacture)**

Fig. 1.

Fig. 1 represents the special patent metallic envelope containing a Supsalv for hot climates. The projecting edge in the middle is cut by scissors—the two ends are then easily pulled apart. The envelope should first be immersed in cool or iced water for 10 minutes.

At the International Congress of Medicine Ehrlich stated that the biochemical action of "606" on spirochetes, not direct but indirect, a third factor found in the body fluids being necessary.

This success is explained by the well-known experiment of Lovaditi: "If living treponemas be placed in a solution of Arsenobenzol (Ehrlich's 606) they continue to live in it. But if a trace of extract of liver be added to the mixture the treponemas are destroyed."

"If 606 has to be taken up and transformed by the liver in order to become toxic to the treponema, there is no better mode of absorption of the drug than by way of the intestine, since all the veins of the intestines join the portal vein. If this be the case no route could be more indirect and more unsatisfactory for active treatment than one that is not intestinal or not intravenous (i.e., prehepatic), since some of the drug must necessarily become fixed everywhere before the passage through the liver has activated it."—Dr. Sabouraud, La Clinique (13-4-1913).

As a result of numerous clinical experiments, Dr. Bagrov, of Moscow, has arrived at the same conclusion, and recommends the rectal method of administration of 606.

**200** cases were treated by the combined treatment in one of the London hospitals. In each case a negative reaction was attained.

**Extremely Simple in Use.****No Ill-effects.****Most Satisfactory Clinical Results.****Rapid Absorption.****MERSALV****FOR MERCURIAL INUNCTION IN  
CONNECTION WITH SUPSALVS  
TREATMENT.**

**CHEMISTRY.**—"Mersalv" contains 10 per cent. metallic mercury, which by a special mechanical process exists in the minutest state of sub-division possible. It is a non-greasy preparation, and, in contra-distinction to other mercurial preparations, contains no organic fats or oils. "Mersalv" is of a white creamy consistence, of pleasant odour, and *cleanly in application.*

In Special Glass Stoppered Bottles for Hot Climates.

**IODOGENOL****IODINE in its Most Reliable and Palatable Form.**

**IODOGENOL** is a preparation containing Iodine in an organic, assimilable and one might almost say "living", form.

**IODOGENOL** possesses about 38 times the physiological activity of that of iodide of potassium, this preparation has, according to the clinical reports of eminent professors, succeeded where the usual iodide treatment had failed after producing undesirable by-effects.

**IODOGENOL** does not produce Iodism or other bad symptoms.

**IODOGENOL** is an undoubted digestive stimulant and promotes appetite and has a markedly beneficial effect on the general nutrition. It has been tried in many of the large hospitals, and given highly satisfactory clinical results in cases of

Syphilis, Rheumatism, the various phases of Tuberculosis, General Debility, etc.

20 minims of **IODOGENOL** are equivalent to 8 grs. Iodide Potassium.

**The SCIENTIFIC TREATMENT OF MALARIA,  
INFLUENZA AND ALLIED AILMENTS.****KINECTINE**

According to Dr. MOUNEYRAT, the discoverer of Galy and Hectine (the widely adopted Salvarsan Substitutes).

**FORMULA:**

Chlorhydrate of Quinine c. Hectine—i.e., Benzo sulfone-para-amino-phenyl-arsenate of Quinine.

Non-toxic, produces no ill-results.  
Easily taken (tablets) and well tolerated.  
Highly satisfactory clinical results.

**Not only a Prophylactic against, but a Specific in,  
INFLUENZA, Catarrh, Coryza, Hay Fever, Malaria, etc.**

H.M.S. —, 27.7.17.

Sir,—I enclose P.O. for the tube of Kinctine. The drug has given every satisfaction.

W. B. H. W., Surgeon, R.N.

The Anglo-French Drug Co., Ltd., Holborn, London, E.C.

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# Indian Medical Gazette.

JUNE.

## TROPICAL AUSTRALIA.

AN unusually frank and outspoken article appeared in the *Journal of Hygiene* (December, 1917), by Dr. W. Nicoll, on "White Australia," "the pleasant dream of a peculiar political party."

He points out what in India we all know, that white people have never yet succeeded in colonising the tropics, and cases like those in Central and South America illustrate precisely the reverse.

Those races have diverged widely from the original-European stock, and such as they are "they represent up to the present the highest level to which European colonisation of the tropics has reached."

Dr. Nicoll points out that the change of environment to the tropics causes a radical alteration "not so much in physical characters as in mental habitude." Even in the United States a century's separation shows that "the modern American is undoubtedly different mentally" from his forbears of Europe, and at the present time a distinct Australian type is being evolved. "It is not a matter of superiority or inferiority; it is merely difference."

Dr. Nicoll then describes the configuration of the Australian Continent, with its "coastal belt of 80 or 100 miles in depth, delimited by a more or less continuous range of hills beyond which is a flat tableland." "In the coast belt the conditions are essentially tropical, with a 'dry' and 'rainy' season." At one place named Innisfail the rainfall rivals that of Cherrapunji, being sometimes 500 to 600 inches a year, the average coastal belt rainfall being about 50 inches. The temperature in the hot wet season is about 80° F., rising before the rain to 90° and 100° F., and the minimum rarely below 50° F. The humidity of the atmosphere is one of the most trying circumstances. "Mosquitoes head the list of inveterate pests" and malaria, though comparatively uncommon as compared with other

tropical regions in some areas, is causing apprehension.

The death rate in Australia is certainly low, but Dr. Nicoll seems to attribute this largely to the immigration of the physically fit.

As for diseases, "all the old-world, well-known diseases are met with, but respiratory diseases and tuberculosis are less frequent."

Australia is not immune from typhoid, but anti-typhoid inoculation is gradually being adopted.

Sprue is a most characteristically tropical disease and is not uncommon; dengue is a cause of more ill-health than any other disease and is often epidemic. Plague has no firm foothold, though all the natural factors for its spread exist. Cholera is decidedly rare and the water supplies are usually good. Dysentery is seldom seen, and Leprosy too is rare. Glandular fever is a disease attracting considerable attention. For some reason yet unknown lead-poisoning is common among children.

Parasitic or worm diseases are very prevalent, and while ankylostomiasis is the most serious worm infection, it is by no means the only one. Filariasis is widespread in South Queensland, and, in 1910, no less than 17 per cent. of all patients admitted to the Brisbane General Hospital were found infected.

The condition called by Dr. Nicoll "mental stasis," is not unknown in the more tropical parts of the continent. It appears to be analogous with what in India we used to call "Bengal Head," and "Punjab Head."

Dr. Nicoll sums up his somewhat pessimistic article by stating his opinion that "Tropical Australia will never under present circumstances support a permanent population of exclusively European character. That it will support a population of European descent I have no doubt, but they will be little more European than are the peoples of the Central and South American States."

To Dr. Nicoll's mind "the chief hope of permanently establishing a white population in Tropical Australia lies in a system of residence for a definite number of years (not more than 10 or 12) with a guarantee of an equivalent position in a temperate region and a liberal vacation at least every second year during the hot



## Thymol.

2. Higher doses, for example 120 grains, removed fewer worms because the vomiting that occurred reduced the amount of drug retained in the stomach to below the amount required for efficient removal of worms; but with 180 grains, though much vomiting occurred, the amount of the drug retained was still sufficient to effect a satisfactory removal of worms.
3. No serious toxic symptoms were noted even with the highest dose.
4. No serious toxic symptoms were noted even with the highest dose.
5. Diminution of the dosage produced a rapid falling off of efficiency.
6. Two treatments with a small dose did not produce a good summation in the results.
7. Thymol was voted by a great majority of the patients treated as more unpleasant to take than oil of chenopodium.
8. The comparisons made under 5, 6 and 7 render thymol less suitable for use in the treatment of children than oil of chenopodium, as for children the smaller doses would be required.
9. The effect on the more resistant forms of worm has been shown to be less, dose for dose, with thymol than with oil of chenopodium.

## Oil of Chenopodium.

2. The dose at which the vomiting causes loss of efficiency was not reached at one institution, although 3 c.c. were given. At another, 46.9 per cent. of vomiting occurred with loss of efficiency at the 15 minims three times, or 2.8 c.c. dosage.
3. The highest dose (i. e., 3 c.c.) occasionally produced toxic effects on the nervous system, such as nerve deafness and coma.
4. In the lower doses, 1.5 c.c. and under, no deafness, or coma occurred.
5. The efficiency was well maintained when the dose was reduced even down to a quarter of the maximum dose.
6. Two half-maximum doses produced a better result than the full maximum dose, and the highest percentage of worms removed was obtained by this treatment, i. e., 94.6 per cent. of necators and 97.5 per cent. of ancylostomes.
10. This renders chenopodium as the drug for choice in treating Chinese, West Indians or any other people with a high percentage of ancylostomes.
11. Chenopodium, being a thin oil, will become more evenly diffused along the intestine.
12. Only 7.6 per cent. of the patients treated with chenopodium showed relative failure of the treatment.
13. Oil of chenopodium has been shown to be more effective in removing all the other species than thymol.

## CONCLUSIONS.

It would appear from the comparisons given in the above table that the half-maximum dose (0.5 c.c. three times, or 1.5 c.c.) of oil of chenopodium is

the treatment for recommendation as a routine vermicide.

It does not have the toxic effects of the full dose, and two treatments have the very satisfactory result of removing 99 per cent. of all worms present.

## INDORE PLAGUE CONFERENCE.

A PLAGUE Conference was held at Indore on the 2nd and 3rd April, 1918, under the presidency of Lieutenant-Colonel F. A. Smith, M.D., I.M.S., Administrative Medical Officer in Central India, and attended by the Chief Medical Officers, State Surgeons, and Health Officers of the Central India States. Major Norman White, C.I.E., M.D., I.M.S., Sanitary Commissioner with the Government of India, came down from Delhi to assist the Conference in their deliberations.

The following resolutions after discussion in each case were put to the conference and agreed to:—

1. That when human or rat plague is present, inoculation of the community with plague vaccine, and the vacation of infected dwellings, result in a very great saving of life.
2. That vacation of infected dwellings should only be encouraged after arrangements have been made for the temporary housing of the refugees near the town or village site.
3. That uncontrolled evacuation, resulting in the invasion of uninfected localities by numerous plague refugees, may be productive of much harm, and village and town communities do well in their own interests to afford such people a cold welcome.
4. That organised quarantine measures and the inspection of railway passengers are not recommended.
5. That certain forms of merchandise, especially grain, are more dangerous as vehicles of plague infection than the human being *per se*. Such merchandise affords unequalled facilities for the transference of rats and rat fleas over long distances. Breaking the bulk of consignments of grain, etc., coming from infected places is a valuable safeguard. Rats are found not uncommonly in goods wagons as well as in country carts. The co-operation of railway companies in diminishing the risk of spread of infection in this way should be solicited.
6. That the grain trade in plague-infected and plague-threatened India is in a very special sense a dangerous trade, and the improvement of grain stores so as to render them rat-free would have results of very great value in diminishing the prevalence of plague.
7. That plague in India is essentially a disease of rats and its prevalence is proportionate to the degree of rat infestation, which in its turn is directly determined by the amount of food and shelter for rats that any given place affords. It follows that all measures designed to limit the food available for rats are plague measures of great importance. The protection of food supplies from the depredations of rats, efficient scavenging, house tidiness and the raising of the sanitary standard of town or village are important anti-plague measures.
8. That rat-destruction measures, by means of poison and traps, are of the greatest value if intelligently and energetically carried out, with a lively appreciation of the habits and customs of rats. Such measures are likely to be most efficacious in the non-epidemic season

season." (How many Europeans in India ever get the chance of escaping each alternate hot season?)

## Current Topics.

### THE PASTEUR INSTITUTE OF INDIA.

The Report of the Pasteur Institute of India to show an increased attendance during the year 1916; of whom 378 were Europeans and 4,982 were natives of India. Of those who received treatment, 70 suffered from rabies, and the percentage of failures was only 0.8.

Major McKendrick, I.M.S., and Captain C. Fox give a very useful statistical report on the 5 years working, 1912-1916, during which period 22,519 persons applied for treatment.

In discussing the prevalence of rabies in India, it is first noted that there is no evidence of any increase in the disease in India, but there has been noticed a slight seasonal rise in the prevalence of human rabies in India during the monsoon period.

The mortality of rabies is influenced by the following factors: number of bites received, depth of bites, effects of the interposition of clothing, effects of cauterization of the wound, position of the bite and the effects of lateness of arrival.

There is no doubt the mortality increases with the number of bites received. The deeper the bite the worse it is; the influence of the interposition of clothing is very marked; the effects of cauterization (thoroughly done or otherwise, as may be) is to reduce, on the whole, the percentage of mortality from 1.52 to 1.17 per month, a proportion of 4 to 3; bites on the face are the most dangerous.

As regards incubation, the "mean incubation period" was 49.4 days; in general, the farther the bite from the central nervous system the longer is the interval before symptoms develop, but

\* On the other hand, we quote the following extract from an article in the *Journal A. Medical Association* (Oct. 27, 1917), which ends as follows:—  
"Evidence has begun to accumulate that healthy white men may be readily acclimatized to the tropical climate at its worst. The amount of sweating necessary to keep the body temperature of a healthy white man from rising above normal is not excessive, even when the man is doing considerable physical work in the mid-day sun in such a tropical climate as that of Manila, provided the man has been sufficiently long on a suitable diet and introduces himself gradually into the work in the sun. In the acclimatization of the white man the most important factor is the proper regulation of the diet."

there is no relation between the incubation period and the infecting dose.

As regards lateness of arrival, we quote the following summary:—  
As we have stated above, proof of the beneficial effects of treatment from the figures at our disposal can only be arrived at by comparative methods, and consequently the results obtained can only be of a comparative nature:—

1. We have found evidence of the handicap of late arrival as shown by an increased mortality in cases of persons bitten on the face and arm, that is to say, amongst those cases in which the expected incubation period is relatively short and the handicap is consequently a heavy one.

2. We have found similar evidence amongst those whose bites are multiple.

3. And we have found evidence of a lengthening of the incubation period amongst cases, the issue of which was fatal in spite of early arrival.

In conclusion we are fully aware of the inadequacy of the statistical treatment of this material. The comparison of the rabies has been laborious, and the time at our disposal has not been sufficient for the working out of all the correlations, errors, etc. Many points of interest appeared only after the tables had been viewed in their completeness. The working out of most of these must remain for the future.

Note.—We take this opportunity of drawing the attention of medical practitioners to the use of atropine in cases which have developed symptoms of rabies. The use of this drug was suggested to us by Major R. Norman White, I.M.S., to whom we acknowledge our thanks. Its effect is to relieve throat spasm, and if it is given at suitable intervals this distressing symptom can be entirely obliterated, with the result that the patient is able to eat and drink. Apart from this beneficial effect, there is always in the background the hope that, in certain cases, throat spasm (which is the proximate cause of death) might be held in check until the phase of recovery had set in.

### CHENOPODIUM AND THYMOL IN HOOK-WORM INFECTION.

In the *Journal A. M. A.* (25th February, 1915), Drs. Darling, Barker and Hacker, of New York, report to the International Health Board (Rockefeller Foundation), on the relative value of thymol and oil of chenopodium in removing hook-worms. The experiments were carried out on batches of adult male prisoners, chosen at random. We quote the following conclusions; chloroform and eucalyptus were of distinctly less value.

### SUMMARY OF COMPARISON OF THE VALUE OF THYMOL AND OIL OF CHENOPODIUM.

1. The 50-grain dose produces a very satisfactory removal of worms.
2. The 30-grain dose produces a very satisfactory removal of worms.
3. The 15-grain dose produces a very satisfactory removal of worms.
4. The 10-grain dose produces a very satisfactory removal of worms.
5. The 5-grain dose produces a very satisfactory removal of worms.
6. The 2-grain dose produces a very satisfactory removal of worms.
7. The 1-grain dose produces a very satisfactory removal of worms.
8. The 0.5-grain dose produces a very satisfactory removal of worms.
9. The 0.2-grain dose produces a very satisfactory removal of worms.
10. The 0.1-grain dose produces a very satisfactory removal of worms.
11. The 0.05-grain dose produces a very satisfactory removal of worms.
12. The 0.02-grain dose produces a very satisfactory removal of worms.
13. The 0.01-grain dose produces a very satisfactory removal of worms.
14. The 0.005-grain dose produces a very satisfactory removal of worms.
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when foci of infection are few. In favourable years energetic measures in the hot dry season might well result in the eradication of infection.

9. That prompt notification of rat mortality or human plague is of the utmost importance and no efforts should be spared to effect improvement in this direction. The closest co-operation in this regard between neighbouring States is essential.

10. That the exposure to the sun of the bedding and clothes of people arriving from infected localities is a valuable safeguard. An hour's exposure at a temperature of 120° F. is sufficient to kill all fleas.

11. That clinical disinfection has a very limited value, and, in the opinion of this Conference, the benefits have not been commensurate with the amount of money and labour commonly expended thereon.

12. That we do not regard the segregation of patients and contacts as necessary.

13. That every effort should be made to make the people realise the danger of close association with the rat and the amount of financial loss that such association entails. To this end it would be well if the elements of home hygiene were taught in all schools.

14. In view of the absence of any public health organisation in municipalities and rural areas in Central India, the Conference realise that serious efforts to eradicate plague infection are not feasible. Nor is it possible at the present time to deal with the numerous other parasitic infections that here as elsewhere in India hamper so seriously industrial and other forms of development. They therefore recommend for the consideration of the Central India States the urgent necessity of developing public health organisation. The necessary outlay would be considerable but the expenditure on well thought-out schemes would be in every way remunerative.

15. They suggest that a central advisory health board would be of very great value.

This is a useful summary, though it contains little that is new. The connection between grain, rats, and plague is as old as the present endemic prevalence of the disease in India.

#### LIFE-HISTORY OF ASCARIS LUMBRICOIDES.

Our readers will remember several papers by Lieutenant-Colonel Clayton-Lane and Major F. H. Stewart, F.M.S., on the life-history of *Ascaris lumbricoides*. In an article in the *Journal of Agricultural Research* (Washington, U.S.A., Vol. XI, No. 8, November 1917), Mr. B. H. Ransom and Mr. W. D. Foster write to support the arguments of Lieutenant-Colonel Clayton-Lane, while they recognise the "very important discoveries" of Major Stewart. They sum up their views as follows:—

The development of *A. lumbricoides* and closely related forms is direct, and no intermediate host is required.

The eggs, when swallowed, hatch out in the alimentary tract; the embryos, however, do not at once settle down in the intestine, but migrate to various other organs, including the liver, spleen, and lungs.

Within a week, in the case of the pig *Ascaris*, the migrating larvae may be found in the lungs and have meanwhile undergone considerable development and growth.

From the lungs the larvae migrate up the trachea and into the oesophagus by way of the pharynx, and this migration up the trachea may already become establish-

ed in pigs, as well as in artificially infected rats and mice as early as a week after infection.

Upon reaching the alimentary tract a second time after their passage through the lungs, the larvae, if in a suitable host, presumably settle down in the intestine and complete their development to maturity: if in an unsuitable host, such as rats and mice, they soon pass out of the body in the feces.

Heavy invasions of the lungs by the larvae of *Ascaris* produce a serious pneumonia, which is frequently fatal in rats and mice, and apparently caused the death of a young pig one week after it had been fed with numerous *Ascaris* eggs.

It is not improbable that ascarids are frequently responsible for lung troubles in children, pigs, and other young animals. The fact that the larvae invade the lungs as well as other organs beyond the alimentary tract, and can cause a serious or even fatal pneumonia, indicates that these parasites are endowed with greater capacity for harm than has heretofore been supposed.

Age is a highly important factor in determining susceptibility to infection with *Ascaris*, and susceptibility to infection greatly decreases as the host animal becomes older. This, of course, is in harmony with the well-known fact that it is particularly children and young pigs among which infestation with *Ascaris* is common, and that *Ascaris* is relatively of rare occurrence in adult human beings and in old hogs.

#### ATROPINE IN THE DIAGNOSIS OF TYPHOID.

The following note is taken from the monograph on this subject, issued by the British Medical Research Committee:—

It is to be noted that these tests were applied to young soldiers and during the period between the fifth and fourteenth days of the disease. There seems no reason why the observations should not hold equally good in civilian practice. They have, however, a scientific, as well as a practical, interest. The results appear to be due to the antagonistic action between the alkaloid and the chemical poison developed in the course of typhoid infection.

When the human body is so infested by bacilli of the typhoid group as to exhibit typhoid, paratyphoid A, or paratyphoid B fever, a toxin is formed which affects the heart in a peculiar manner; the presence of this toxin can be detected by observing the abnormal yet characteristic reaction of such hearts to certain drugs, notably atropine.

The principle of the test seems to depend upon the following known facts:—

1. Under ordinary conditions the administration of atropine markedly increases the rate of heart beat.

2. Bradycardia is generally observed in typhoid infection.

3. In this infection the administration of atropine fails to increase the heart beats proportionately to the increase observed in health or in other diseases.

The application of the test is as follows:—

"The patient lies horizontally and is instructed to remain completely at rest throughout this test, which is not employed until at least one hour has elapsed from the last meal. The pulse rate is counted, minute by minute, until it is found to be steady; ten minutes of such counting usually suffices. Atropine sulphate is then injected hypodermically in the dose of  $\frac{1}{2}$  grain, preferably over the triceps region to insure rapid absorption. An interval of 25 minutes is allowed to elapse, and the pulse is again counted, minute by minute, until it is clear that any rise which may follow the injection has passed off: 15 or 20 minutes may be

necessary for this purpose when the pulse rate is raised at the first count."

For instance, the average before the injection is 68, and that after the injection is 94, giving a difference of 26 beats. In this case the conclusion is reached that the infection is not typhoid. When the increase is not greater than 14 beats, typhoid infection is indicated. In the first instance the reaction is said to be negative, and in the second, positive. Experience fixes the upper limit of a positive reaction at 14 beats per minute, and the lower limit of a negative reaction at 15 beats per minute.

If the patient is admitted during the first fortnight of his illness, the test is applied as soon as possible after admission and is charted with the temperature. When a positive reaction (little or no response to atropine) is obtained, the diagnosis of infection with a member of the enteric group of organisms may be made. In the case of a negative reaction, the test should be repeated after two or three days, and if again negative it is again repeated. Three negative reactions falling within the first fortnight of the illness exclude the presence of typhoid with a considerable degree of certainty; there are rare exceptions and in these a continuation of the test is usually suggested by the symptoms and remaining clinical signs.

True cases of typhoid group which are admitted after the fourteenth day frequently yield positive reactions, but negative reactions after this period of illness are often unreliable.

#### SURGERY IN THE AGED.

DR. F. C. YEOMANS, of New York, has a valuable article on Prognosis in Surgery of the Aged, based on his own experience of 100 cases of ages 50 to 86, average age 62 years. He writes (*American Journal of Surgery*, February 1918):—

"Surgery of the aged is *imperative* or *elective*. In certain cases, as strangulated hernia, gangrene of the foot or empyema of the gall-bladder, the surgeon has no choice, the call is imperative. In other cases operation is elective. Broad experience and sound judgment will be the best guides for the surgeon in presenting to the patient and his friends the probable outcome of operative procedure, for, after all, the decision rests with them.

The indications for *elective* operation are (1) to effect a cure, as in carcinoma of the breast suitable for radical removal; (2) to prolong life, *e. g.*, in the same mammary cancer that has become radically inoperable but where a partial operation will be useful.

It is trite but true that a man is as old as his arteries.

From the surgical viewpoint he is also as old as his heart, kidneys or lungs. Chronic valvular disease of the heart, when compensated, does not contraindicate operation but a fatty or degenerated myocardium, bars general anesthesia. The blood-pressure reading is so variable as not to be a valuable guide. A trace of albumin and an occasional hyalin cast are not significant, but fatty and epithelial casts oppose general anesthesia. Chronic bronchitis is apt to develop pulmonary oedema after ether or chloroform, but this is circumvented by the use of gas and oxygen or local anesthesia.

Aged, fat and flabby individuals are poor surgical risks, as are operations which heal by suppuration and granulation.

*Preparatory treatment.*—The patient must not be weakened by underfeeding nor depleted by drastic catharsis. The drinking of water is to be encouraged

to fill the blood vessels and flush the kidneys. The skin of the operative field, often thick and scaly in old people, must be carefully prepared to prevent infection. Irritated areas are relieved by a few days' application of equal parts of corn starch and zinc oxide ointment.

*Anesthetic.*—The anesthetic of choice in all cases is local by novocain, one-half per cent., as was employed in 36 per cent. of this series of cases. The second choice, especially in the presence of pulmonary irritation, is nitrous oxide gas and oxygen. This is particularly suited to severe but brief operations, as the amputation of limbs. Next comes chloroform, in the hands of an expert, and finally ether. Local anesthesia is always to be preferred when practicable in both major and minor operations on old people. Broader experience overcomes its apparent handicap to the surgeon, and its more general use will, beyond question, result in the saving of many lives that would succumb to a general anesthetic.

When a general anesthetic is to be administered, the plan I have followed to shorten its duration is to have the operative field in readiness to begin the operation the instant the patient is fully narcotized. The patient is placed upon the operating table, the field of operation is prepared with iodine and covered with a sterile towel and the patient draped before beginning the administration of the anesthetic. These preliminaries save the patient many valuable minutes, and time is precious in the surgery of the aged.

I employ morphine and atropine as a preliminary to local anesthesia, but recently have abandoned this medication before general anesthesia in the aged, for it delays the reaction from the operation and increases shock.

*Five cardinal rules* for successful surgery of old people are:—

1. A correct diagnosis made by thorough and, if necessary, repeated examinations before the operation.
2. A definite plan of operation, executed with the greatest celerity compatible with safety.
3. Rigid asepsis, for the powers of resistance to infection in the aged are limited.
4. Control of hæmorrhage by the Esmarch bandage, posture, segregation and by division of vessels between clamps, for blood lost is not quickly replenished in old people.
5. Careful handling of tissues. Trauma of tissues results in diminished resistance and favors infection. "Quickly in and quickly out" is imperative when invading the abdominal cavity and with the least possible evisceration.

Furthermore, the body heat must be conserved by warm covering during the operation and protection thereafter, including the avoidance of drafts.

Good nursing and nourishment are essential to rapid convalescence, and early sitting up, to prevent hypostatic pneumonia.

The safeguards against shock are a definitely planned operation, short anesthesia, deft technique, "bloodless surgery" and conservation of body heat.

*Favorable prognostic factors* in surgery of the aged may be thus stated:—

First: Physically the very old represent the survival of the fittest or, if naturally delicate, they have not undermined their constitution by dissipation or excess.

Second: Abstemious habits of eating and drinking and a routine life are accompaniments of advancing years, hence post-operative toxemia and delirium tremens are less frequent complications than in younger people.

Third: The general condition of the patient will be of more weight in deciding the operability of a given

case than any slight deviation from the normal of a particular organ as the heart, the kidney or the lung.

Fourth: The selection of the anesthetic suitable to the patient's condition and to the proposed operation will frequently be a more potent factor in the prognosis than the surgical procedure itself. In major operations under general anesthesia the responsibility of the anesthetist is on a par with that of the surgeon. The more frequently local anesthesia or gas and oxygen can be employed, the better the prognosis.

Fifth: In cancer cases the liability to recurrence after radical operation diminishes with advancing years, and after palliative operations malignant growths are retarded for longer periods than in younger subjects with their more active tissue changes.

The observations made from our experience justify the conclusion that—

Imperative operations must be performed irrespective of the age of the patient; and that—

Other things being equal, in elective cases, age *per se* is not a bar to successful surgery.

#### TREATMENT OF CHENOPODIUM POISONING.

Now that the use of oil of chenopodium is largely used as a substitute for thymol in cases of hookworm infection, the following note on the treatment of cases of accidental poisoning is worth reproducing from the *Journal of the American Medical Association*.

When large doses have been swallowed lavage may be resorted to with beneficial results. If carried out promptly after the oil is taken, it may prove effective in preventing serious consequences, since absorption of the oil from the stomach is slow.

The importance of not delaying lavage too long after the poison has been swallowed is further emphasized by the fact that absorption from the duodenum was found to be very rapid. In some of the experiments the introduction of oil of chenopodium was followed by the immediate appearance of the characteristic effect on the circulation.

No chemical antidote has yet been found. The treatment in cases of poisoning would, therefore, be symptomatic. Stimulation of the respiratory and the circulatory systems would undoubtedly be of value. In experiments on the isolated heart, digitalis and epinephrin are excellent antagonists. The stimulating action of digitalis has been found to be very persistent, and may completely overcome the depression caused by the oil. Caffeine was also tried out. It, on the contrary, aided the action of the oil of chenopodium. Heart action ceased altogether when the use of caffeine followed treatment with chenopodium. The action of caffeine in poisoning with chenopodium may be different, however, in intact animals, and is being investigated in this laboratory.

While oil of chenopodium may be regarded as a safe remedy for patients in good physical condition, it should be used very cautiously in poorly nourished and weak or neurotic individuals. A diet containing a liberal amount of fats and carbohydrates, fed at least for several days before the treatment is instituted, may render the drug much safer. The routine administration of large doses of castor oil before and soon after oil of chenopodium, as recommended by Hall and Foster, should be given serious consideration, as it may prove to be of prophylactic value.

#### THE AMERICAN JOURNAL OF OPHTHALMOLOGY.

FOLLOWING a good and successful British example, the leading ophthalmic journals of the

United States have become incorporated into one, with the above title and with a strong editorial staff and a large number of collaborators, including, we notice, Lieutenant-Colonel R. Elliot, I.M.S. (late of Madras,) and Lieutenant-Colonel F. P. Maynard, I.M.S. (of Calcutta). It is surely destined to become one of the leading journals in this speciality. It is admirably printed and set up, well illustrated, and contains original papers, abstracts, society proceedings, editorials, book notices, news items and a digest of ophthalmic literature.

The first number is dated January 1918; the publishers are *The Ophthalmic Publishing Co.*, 7 West Madison Street, Chicago, U. S. A., and the price for single copy is one dollar, or for 12 monthly issues ten dollars per annum.

In the *Journal A. M. A.* (16th February, 1918), Dr. Michel of Porto Rico writes as follows of his experience of the use of a "Monilia Vaccine" in the treatment of sprue:—

Of 81 cases reported, 62 patients have completed the treatment. All cases were diagnosed by Ashford, and monilia psilosis was isolated from the feces. In all these cases the complement fixation test was positive. The diet was regulated so as to fit each individual case. The only medication given was to stimulate digestion. Sprue being confused with other diseases, and being often complicated, a careful positive diagnosis was made in each case. Cases of sprue without complications responded most readily to the treatment. Americans responded very quickly to the treatment and required a shorter time than Porto Ricans. Of 62 patients treated, 49 patients were discharged cured, 12 were improved, and 1 died. The results of the vaccine treatment are very encouraging, and all patients under treatment have shown great improvement. In noting the results of the treatment, the mental attitude of the patients has been considered to ascertain whether the injections and reactions produced a psychic improvement only. In certain cases there was a distinct abatement of sprue symptoms after the third injection, and instead of a diarrhoea, constipation resulted. The most notable feature was the gain in weight, which was progressive from week to week. There was, in all cases, a great improvement in the general physical condition of the patient, and the disappearance of the monilia from the feces. The results of this treatment are very favorable, and it is believed that monilia psilosis vaccine should be tried in other localities where sprue is present.

OUR July number will be largely devoted to the subject of Quinine and Malaria, and will include papers by Lt.-Colonel Sir Ronald Ross, F.R.S., and Sir Leonard Rogers, F.R.S., I.M.S.

#### Reviews.

**Antimalarial Work in Macedonia.**—By Dr. W. G. WILLOUGHBY and Dr. L. CASSIDY. London: H. K. Lewis & Co. Crown 8vo. Price 3s. 6d.

THE British troops in Macedonia are now approaching their third malarial season in and



around Salonica and the little book before us is a record of the antimalarial work done during the past years 1916 and 1917 to combat the disease, which has prevailed to a considerable extent among the troops there. All other causes of sickness "are dwarfed" (we are told) by that due to malaria. The disease is very prevalent and the conditions described by Drs. Willoughby and Cassidy show conditions, very familiar to us in India, for the widespread prevalence of malarial attacks. The hills and valleys and streams are very numerous, and rocky pools extremely common, and lakes surrounded by weedy marshes or shallows are common features. The abundant vegetation along the banks of streams and lakes afford the needed shelter for the mosquito by day, and the "great heat of the Macedonian summer" favours mosquito life. Moreover, some of the worst haunts of the mosquito lie within the fighting zone and this naturally limits the extent of antimalarial measures. The universal "dug-out" is a favourite haunt of the mosquito, and they can only be expelled by spraying the "dug-out" inside with formalin or burning sulphur (1 lb. to 500 c.ft. of space); even churches have to be disinfected and cleared of mosquitoes before services are held!

Naturally war is waged against these pest in all recognised ways—draining, filling and oiling (half a pint of petroleum to each 100 s.ft. of water surface). The men are provided with nets—and the mesh of the mosquito net should be "of at least 12 openings to the inch and a finer mesh of 18 inches is preferable"—and improved bivouac nets are now in use. For night work face-nets and gloves are needed and the "shorts" in use have a fold turned up in the day-time which can be turned down over the bare legs at night. "Repellants" are in some favour, but they are only useful as long as the odour is strong, and oil of citronella only keeps off the mosquitoes for half an hour!

There is a useful chapter on "*quinine prophylaxis*," a still debated subject on which our authors say that "expert opinion has been varied and contradictory," and in their opinion the prophylactic value of quinine has been "so incomplete and questionable" that no other precaution can be for a moment neglected. "Men taking 10 grains of sulphate in solution twice a week and often up to 10 grains daily for a long period have been taken ill with malaria, primary and recurrent."

*Curative* doses of 30 grains daily would do good, but these authors conclude that "as a form of malaria prevention, quinine prophylaxis can only be considered an unsatisfactory refuge for those destitute of other better forms."

In fact medical opinion is coming round to this view. While everyone knows and recognises the great value of quinine as the method of

treating the malarial fevers and no one whose experience and opinion is worth having has any doubt about its *curative* value when given at the right time and in full dose during an attack, there is much strong opinion against its prophylactic value. The great value of the Government sale of pure quinine in India, through the post offices and other agencies, is that it provides in the form of "treatments" twenty tablets of pure quinine to *cure* the case.

We can recommend this little book to medical officers in India. It is brightly written and gives us a good idea of the work before the medical officers of our armies in Macedonia.

**Field Sanitation.**—By C. G. MOOR and E. A. COOPER. London: Baillière, Tindall & Cox. Price 2s. 6d.

THIS useful and practical book by two well-known sanitarians whose good work with the 1st London Sanitary Company has been much appreciated may confidently be recommended to medical officers going on field service.

It is largely based on actual experience in the field and takes full notice of the many changes in sanitary work and appliances that have developed during the war. It is eminently a book on *Field sanitation*. We would specially call attention to the very practical chapters on disposal of refuse and on flies and other insect pests. The chapters on latrine and urinal construction and on baths and laundries are also excellent.

We have formed a high opinion of this book, and medical officers on field service will be well advised to possess it.

**The Practice of Medicine.**—By Sir FREDERICK TAYLOR, Bart., M.D. 11th Edition London: J. & A. Churchill. Price 24s.

To praise this well tried volume on the *Practice of Medicine* by the distinguished President of the Royal College of Physicians is unnecessary. Its first edition appeared 28 years ago in 1890 and its eleventh in 1918 and during that period it has been proved to be a standard and reliable book for many generations of medical students.

The new and eleventh edition, however, has undergone much revision and many new subjects have been introduced; for example, trench fever, heart strain, T. N. T. poisoning, infantilism, renal hæmorrhage, and trench frostbite. Much new matter has been introduced into the chapters dealing with the ductless glands, arterial tension, diabetes and beri-beri, and more illustrations have been added.

We have especially noticed the chapters on what are called tropical diseases and find them up to date and accurate, and such diseases as ratbite fever, sandfly fever, blackwater fever, and

trypanosomiasis are treated as adequately as need be in a students' book. The chapter on dysentery is quite good and the notes on Madura foot and allied diseases are sufficient. There is an excellent section on hydatid of the liver. The account of diabetes too is excellent, and diabetes and scurvy are described in an up-to-date way.

We can with complete confidence recommend the new edition of "Taylor" as one of the best students' books in the English language.

**Aids to Rational Therapeutics.**—By R. W. LEFTWICH. London: Baillière, Tindall & Cox. Price 3s. 6d. net.

THIS book belongs to the well known and useful *Aid Series*, but it is decidedly original and of equal value to the practitioner. Instead of following text-books of medicine in giving the treatment of each disease after a description of ætiology, symptoms, etc., the diseases are grouped according to their pathology, and so in each group are diseases requiring the same sort of treatment. A glance at the table of contents will show how this is done: the catarrhal group; the serous effusion group (pleurisy, pericarditis, etc.); the calcium insufficiency group (purpura, chilblains, rickets, cretinism); the anæmic group (anæmia, chlorosis, Banti's disease, leukæmia); the vitamine insufficiency group (scurvy, beri-beri, etc.); the infective fever group; the rheumatic group (muscular rheumatism, articular rheumatism, tonsillitis, iritis, gout, etc.); the high tension group (aneurysm, arteriosclerosis, lead-poisoning, cyanosis, migraine, and uræmia); the tuberculous group; the syphilitic groups; the muscular atony group (atonic dyspepsia, constipation, enteroploxis, etc.); the psychosis group (hysteria, neurasthenia, and some cases of insanity); the colic group (hepatic, pancreatic, renal, ureteral, Fallopian, appendicular, intestinal, etc.); the tonic spasm group; and a lot of "ungrouped diseases."

The little book is one which will be found useful by many practitioners; it is very suggestive and original and full of sound advice on therapeutics.

**Rules for Recovery from Tuberculosis.**—By LAWRENCE BROWN, M.D., 2nd Edition. New York: Lea and Febiger.

THIS useful little book has as its subtitle "a layman's hand-book of treatment"; it is for the use of patients and to be carefully read by them on the assumption that such patients are not children, but persons "endowed with more or less mature intelligence."

The little book is divided into 25 chapters, on rest, food, fresh air, alcohol, on sitting out, on sleeping out, on exercise, on the temperature of the body, on cough, on body weight, &c., &c. The chapters on clothing are very practical and

those on exercise, and on how and when we contract tuberculosis, and on food, deserve to be studied by doctor and patient, and especially that on "the best medicine"—fresh air.

We can confidently recommend this book. It will fill a want. It is handy and well printed.

**The Systematic Treatment of Gonorrhœa.**—By N. P. L. LUMB, Capt., R.A.M.C. (F). H. K. Lewis & Co., Ltd., 1918. Crown 8vo. Price 4s 6d. net.

CAPTAIN LUMB begins his useful and practical little book by emphasising two facts—(1) that early treatment means early cure, and (2) that gleet is an infectious condition and needs treatment just as much as an acute case. Correct treatment within 24 to 48 hours of the discharge will in most cases allow the development of no complication. The difficulty is to get the patient to apply for treatment early enough.

The little book contains eleven chapters, on examination, pathology, examination of the urine, prostate, routine treatment, special treatments, treatments of complications, on conjunctivitis, cases complicated by syphilis and the test of cure.

The routine treatment which he describes is—light diet, rest, urotropine combined with acid sodium phosphate and aperients and in some cases bromides as sedatives.

Irrigation should be commenced at once except where acute epididymitis exists or a hyper-acute urethritis—a generally useful solution is 1 in 8000 permanganate of potash (2 or 3 pints, temp. not under 100° F.)—by means of a cane and rubber tube with blunt glass nozzle, twice a day.

Full details are given of special treatment by vaccines; a mixed vaccine of staphylococci (150 millions per c.c.) and gonococci (50 millions per c.c.) gives good results.

Electro-chemical treatment is described. Dr. Lumb considers that the mercurial treatment on the whole rather masks the disease and does not destroy the gonococcus.

The chapter on complications is good, and a very useful chapter is that on chronic gonorrhœa. There is a useful and practical chapter on the patient and the mental condition into which some patients lapse, due to need of secrecy, etc. A note on the test of cure is also appended.

We can confidently recommend this useful little book.

**Minor Maladies**—By LEONARD WILLIAMS, M.D., 4th Edition. London: Baillière, Tindall & Cox, 1918. Crown 8vo. Price 7s. 6d.

ON previous occasions we have welcomed earlier editions of this most useful work. Each edition has been good, but the new or fourth edition is the best of all. The book still remains handy and well printed, but this edition has

many changes; the section on constipation has been rewritten; an excellent chapter on minor glandular insufficiencies contains much of interest and much that is new, a useful chapter on Old Age is also added.

The book is mainly intended for junior practitioners in that it deals with subjects not easily taught in hospitals or dealt with in text-books but which are of primary importance to the family practitioner.

Take the chapter on the "common cold," it is full of excellent and useful advice; a common cold is of course a microbic infection but the other factors, a chill, a wetting, etc., which lower resistance to the ever-present microbe are really of much greater importance, *qua* prevention, than the microbe.

The chapter on glandular insufficiencies is very good and contains much that will be useful to the practitioner. The subject of endocrine secretions is not fully or widely known and a chapter like this must be useful to practitioners of all ages. The chapter on goutiness and on albuminuria is excellent and practical, and there is much of value in that devoted to general health. There will be few practitioners who will not pick up useful information from the chapter on 'some drugs and their uses'; the last chapter on insanity as met with in everyday practice is also good.

'Rheumatism,' 'neuralgia,' and 'headache' are very common complaints and are adequately dealt with. We can again strongly recommend this useful and eminently practical book.

**Medical Diary, 1918.**—By B. K. PAUL & Co. Calcutta.

THIS book is a combination of advertisement, diary, medical directory and therapeutic index, and as such has doubtless its value. It is published by the well-known firm of B. K. Paul & Co., Chemists & Druggists, Calcutta.

## SPECIAL ARTICLE.

### THE PREVENTION OF SCURVY AND BERI-BERI.

A VERY valuable article appeared in *The Transactions of the Society of Tropical Medicine and Hygiene* (July 1917), by Miss Harriette Chick and Miss Margaret Hume, being an account of work done at the Lister Institute, London, on the "distribution among food-stuffs of the substances required for the prevention of (a) beri-beri and (b) scurvy."

Scurvy and beri-beri are now classed among the "deficiency" diseases—and the present position may be summed up as follows:—

For perfect nutrition the human being requires—in addition to an adequate ration of fat, protein, carbohydrate, salts and water—a sufficient supply of accessory food factor or vitamins. These substances have not so far been successfully isolated; little is known of their chemical or physical properties, and, at the present time, their presence can only be detected by biological methods. There are, at least, two distinct classes of these vitamins: (1) the vitamin whose presence in a diet is an essential for the proper nutrition of the nervous system, and whose absence or deficiency will give rise to beri-beri—for the sake of brevity this may be called the anti-neuritic or anti-beri-beri vitamin; and (2) the anti-scorbutic vitamin, whose absence or deficiency in a diet will occasion scurvy with its characteristic pathological changes.

Scurvy and beri-beri are now known to be respectively caused by a deficiency in these two different classes of vitamin, which possess different properties, play a different part in metabolism, and are differently distributed among food-stuffs in nature.

Deficiency diseases are practically non-existent among modern civilized Europeans, for, when living upon the ordinary mixed diet of civilization, it is difficult to avoid getting an adequate amount of each separate vitamin. It is where the diet is more simple, as is the case with many Eastern races, that the risk of deficiency disease becomes proportionately greater. The food then needs careful scrutiny to ensure that all necessary vitamins should be included in the comparatively few substances of which the diet is composed . . . . .

#### DISTRIBUTION OF ANTI-SCORBUTIC VITAMINE.

While there is a good deal of empirical knowledge upon this subject, few accurate scientific data are available, and what exist are found chiefly in the work of Axel Holst and his colleagues Drs. Fürst and Frölich, in the University of Christiania (1907, 1912, 1913). By depriving guinea-pigs of fresh green food, and offering only a diet of grain and water, these workers were able to induce a disease analogous to human scurvy, from which the animal died within a month from the commencement of the restricted diet. The post-mortem appearances showed all the lesions of typical scurvy, and included changes in bone, cartilage and bone marrow, loosening of the teeth, and, in addition, hæmorrhages, which might occur in any situation. These workers also studied the influence of various additions to this scurvy diet, and investigated the distribution of the anti-scorbutic principle among various vegetable food-stuffs and its resistance to drying and to exposure to high temperatures. The commonly accepted view that fresh vegetables and fruits are the chief source of anti-scorbutic vitamin was abundantly confirmed by their experimental work.

It is at once evident that the distribution of the anti-scurvy vitamin is much more restricted than that of the anti-beri-beri vitamin. There are here no special places where deposits are found of highly concentrated anti-scorbutic material, but it is present in all living (actively metabolic) tissues of plants and (to a much less degree) in those of animals.

The anti-scorbutic principle has not been found present in dried vegetables or in any dried seeds, such as cereals or pulses, diets of which form the classic means of producing the disease of scurvy. If, however, these seeds are moistened and allowed to germinate, the anti-scorbutic principle is created anew with the beginnings of active cell life. As far as our present knowledge goes, the presence of the anti-scorbutic vitamin is always associated with living tissues in which active metabolism is taking place. When viable seeds are in the dry, resting condition, all the active processes concerned with life and metabolism are temporarily suspended, and disappearance of the anti-scorbutic principle accompanies this cessation.

**Fruit Juice.**—Fresh fruit juices are exceedingly rich in anti-scorbutic vitamine. Holst and his co-workers pointed out the value of fresh lemon and fresh raspberry juice in preventing experimental scurvy, and our researches have been made chiefly with orange and lemon juice. With these latter we have also been able to effect satisfactory cures from an acute scorbutic condition.

The results of our experiments with preserved fruit juice, e.g., lime juice, have not been so encouraging, the anti-scorbutic power being very feeble in comparison with fresh juices. We are now investigating various methods of preservation in the hope that we may be able to suggest improvements. After reading the history of our Navy and Mercantile Marine, it is impossible to resist the conviction that, in former times, preserved fruit juice was of distinct value in preventing human scurvy, and it is not unlikely that modern methods of manufacture may have introduced some modification detrimental to the anti-scorbutic principle it originally contained.

**Fresh Vegetables.**—Among the fresh vegetables investigated, the cabbage was found best, partly, no doubt, because fresh green leaves happen to be the natural food of our experimental animal. Onions were also found to be powerfully anti-scorbutic, in spite of their dry appearance from the outside. Ordinary Spanish onions contain 95 per cent. of water, the cells are all in a turgid condition, and, botanically, the vegetable is to be regarded as a live bud. Potatoes and carrots must also be regarded as composed of live turgid tissue; they are also of great value, though found to be slightly inferior to cabbage leaves. In our experiments the potatoes were boiled before giving to the animals, and doubtless there was some loss of the anti-scorbutic principle during the process of cooking. It was, however, a necessary measure, as guinea-pigs are not able to take potatoes in the raw condition.

**Milk.**—Cow's milk possesses very low anti-scorbutic value. In our experience a ration of 50 grams daily was insufficient to protect guinea-pigs from scurvy. Frölich (1912), however, found that they could be protected by an exclusive diet of milk, and we have found the same result if a minimum of 100 grams is taken daily. This is about twenty times the necessary daily ration (viz., 5 grams) of fresh cabbage or germinated peas, or fresh fruit juice. It seems probable that infants nourished on cow's milk do not obtain any excess of anti-scorbutic principle, especially if the milk is previously boiled. The modern custom of adding a small daily ration of fresh fruit juice, or other anti-scorbutic, appears to have sound and scientific foundation.

**Meat.**—It is practical experience, obtained especially from the history of Arctic exploration, that fresh meat will prevent human scurvy if taken regularly in fair quantity. The expressed juice of raw meat is also considered to be of value in the cure and prevention of infantile scurvy. For prevention of experimental guinea-pig scurvy, meat was found to be very disappointing, for little, if any, protection could be demonstrated. It must be remembered that meat is an unnatural food for guinea-pigs; they will not eat it even when cooked, and the experiments have to be made with the expressed juices. Allowance must also be made for the high susceptibility to scurvy of this animal, which is undoubtedly much greater than that of the human being; but, when all this is taken into account, one is forced to conclude that meat is far inferior as an anti-scorbutic to vegetables and fruit, and that the daily allowance must be large if reliance is to be placed upon it for the prevention of scurvy.

**Yeast.**—Yeast Extract A and autolysed yeast, both of which were shown to contain the anti-beri-beri vitamine in high concentration, uninjured by the process of preparation, were found useless for the prevention of scurvy. Animals receiving as large a daily ration as could conveniently be taken, died of acute scurvy in the same period as the control animals on the "scurvy diet."

#### RESISTANCE OF THE ANTI-BERI-BERI AND ANTI-SCORBUTIC VITAMINE RESPECTIVELY WHEN EXPOSED TO DRYING, HIGH TEMPERATURES, ETC.

(A) **Drying.**—From the common presence of the anti-beri-beri vitamine among dry foodstuffs, it is evident that this substance is not sensitive to the process of drying. It is very significant that its chief sources should be found in dry seeds, such as cereals and pulses.

The case is otherwise with the anti-scorbutic vitamine. This principle seems to be absent or deficient in all dry foodstuffs, such, for example, as cereals and pulses, and to be rapidly destroyed when the animal and vegetable tissues, in which it is naturally contained, are subjected to drying. Holst and Frölich found dried vegetables of little use for the protection of guinea-pigs from scurvy, and we have confirmed their observations. A similar result has been noted in human experience. Dried vegetables were found useless in the epidemic of scurvy which ravaged the Austrian army in Hungary in the early part of the 18th century (Budd, 1840), and including dried potatoes, were tried with the same disappointing results during the American Civil War ("Medical History of the War of Rebellion," Vol. III., Washington).

#### PREVENTION OF BERI-BERI.

**Importance of the nature of the Cereal food in the prevention of human beri-beri.**—In almost all cases human beri-beri is to be attributed to a defect in character of the cereal employed in the diet.

The best known and best studied case is that of the rice-eating populations of the Dutch Indies, Malay States, the Philippine Islands, etc.: it has been the subject of numerous series of researches, among which those of Eijkman, Grijns, Braddon, Fraser and Stanton, Vedder and Chamberlain are among the more important. All these workers are agreed that the disease is caused by a defect in the rice taken, which defect can be traced to the complete decortication which takes place in the modern steam milling of the grain. Beri-beri is prevented in cases where unmilled rice is substituted for the "polished" rice, or where the bran ("polishings") removed in the milling is added to it. The general opinion is that the anti-beri-beri vitamine is contained in the inmost layer of cells (*aleurone layer*) of the skin, which layer of cells is removed with the bran in the process of preparation. Our experiments indicate that the germ (or embryo) of the grain, also removed during milling, is the principal source of the anti-neuritis vitamine, present also to a less extent in the bran. It is not so generally realised, however, that the same principle applies to other cereals, or that an equal danger of beri-beri is to be apprehended for a wheat-eating population under certain circumstances. In the modern "roller" milling of wheat, there is complete separation of bran and germ from the flour: unless, therefore, these constituents are purposely included later (as in brown flour, and "standard" flour) one may regard ordinary white flour and the bread or biscuit baked from it, as being free from these valuable constituents.

The deficiency of anti-neuritic vitamine in white wheaten flour was shewn by Holst (1907), Edie and Simpson (1911) and also by ourselves (see footnote page 150), to occasion polyneuritis in pigeons in a manner exactly similar to polished rice. The following three incidents shew that these results are also applicable to the case of beri-beri in man. Under ordinary circumstances this deficiency of vitamine in white bread is well supplied in the other articles of the usual mixed diet of the European. It is in cases where extremes of climate restrict the variety of available foodstuffs, or where there is temporary separation from fresh food supplies on long sea voyages, or by the exigencies of active service on long campaigns, that this defect in the bread ration may become apparent in a tragic manner.

(1) Little (1912) states that in Newfoundland and Labrador, where in mid-winter and spring many



persons are obliged to subsist largely on bread, beri-beri frequently occurs. At the present time the bread is made from fine wheat flour; in the memory of the older inhabitants, when the bread was made from "brown" flour, the disease was unknown. In 1910 the following interesting event took place:—A ship laden with whole-wheat flour ran ashore, and a considerable proportion of her cargo was removed in order to lighten her, and later was consumed by the adjacent population. There was no case of beri-beri in that region for a year following this occurrence.

(2) Beri-beri was rare on Norwegian ships before 1894, after which date it became much more frequent. This frequency coincided with an alteration of diet which was made compulsory in that year in response to a popular demand for an "amelioration" of the conditions of life in the Norwegian mercantile marine. Previously the sailors on long voyages used biscuits made from rye flour; subsequently the masters of ships were obliged to supply bread baked from white wheaten flour or a mixture of wheat and rye flour (Holst, 1911). It is an interesting corollary upon our own experimental work to note that in the milling of rye flour there is no separation of the germ.

(3) The most impressive case of all is to be found in the tragic experiences of our own troops recently operating in Mesopotamia. In his "Account of the Medical Arrangements, etc., during the Siege of Kut-el-Amara" (Dec. 1915 to April, 1916), Colonel Hehir, I.M.S. (1917), states, "in the early stage of the siege a recrudescence of beri-beri amongst British troops gave rise to some apprehension, but it then disappeared; whilst in Indian troops and followers during the latter half of the siege scurvy caused anxiety." From other entries in this vivid and valuable diary, it is seen that the British troops in the garrison received a cereal ration of wheat flour during the first two months of the siege. After February 5th, 1916, from one-third to one-half of this flour was replaced by barley flour and by "atta," the coarsely-milled wheat usual in the Indian sepoy's ration. It is very significant that beri-beri should have broken out among the British troops while upon their normal ration of white wheaten flour, and should have cleared up when they were obliged to share in the more coarsely milled (and doubtless germ-containing) grain of their Indian fellow soldiers. There is no doubt, from the wealth of detail given in Colonel Hehir's report, that the British troops were protected from scurvy by the ample rations of meat (12oz. at first; later, Jan. 22nd, 1916, 8oz.), or horseflesh (1½lb. March 4th, 1916), served out to them throughout the siege. The Indian soldiers, while protected from beri-beri by the nature of their cereal ration, failed, in many cases, to obtain a sufficient supply of anti-scorbutic vitamine, owing to their refusal to eat fresh meat, in spite of the admirable and persuasive manifesto issued by Colonel Hehir upon the subject.

During the whole operations in Mesopotamia, the Indian soldier seems to have been well protected from beri-beri. This was to be expected, for, in addition to an unspoiled cereal, he normally gets a generous daily ration of "dhal," consisting of various dry pulses, which, as may be seen from the foregoing work, are also valuable sources of anti-beri-beri vitamine. These, however, did not afford protection from scurvy, which was specially prevalent among the Indians, as, for example, in the summer of 1916, when, presumably, great difficulty was experienced in providing fresh fruit and vegetables (*Mesopotamia Report*, X, 42).

The deduction to be drawn from all this experience is as follows:—

For the prevention of beri-beri it is in the highest degree desirable that the germ (embryo) and the bran of wheat should not be excluded from the flour destined for manufacture of bread and biscuit for troops on active service. This is the more necessary when the troops are separated from fresh food supplies and the rest of the ration consists

largely of tinned foods, seeing that these articles are deficient in all vitamins, owing to their previous sterilisation at high temperatures.

**Yeast and Yeast Extract.**—Yeast is acknowledged to be a most valuable source of anti-neuritic vitamine. There is not much evidence at present available as to the value of yeast and yeast extracts in the prevention of human beri-beri; we have not been able to find any report of such a trial. Ordinary dried yeast is very disagreeable to take, and causes digestive disturbance, but many preparations possess none of these defects. They have the agreeable savoury taste of a meat extract, and are largely used as an ingredient in certain soup cubes on the market. We have examined one of the principal commercial yeast extracts and could detect no loss of the original vitamine of the yeast owing to the method of preparation. Soup squares form at all times a very popular addition to the soldier's ration, and might well be limited to those containing a certain proportion of yeast extract, seeing that pure meat extracts have been found deficient in anti-beri-beri vitamine. By such a measure a valuable extra supply of anti-beri-beri vitamine could be added to the ration in a convenient and palatable form.

**Dried Eggs.**—It will be seen from the examination of two commercial samples of desiccated eggs that so valuable an article of diet as the fresh egg can be successfully dried without losing the anti-beri-beri properties. Dried eggs may prove too expensive to form any part of the ordinary soldier's or sailor's dietary, but there can be no doubt as to their suitability for inclusion in hospital stores. Intestinal infections form a large part of the medical casualties in armies on active service, specially when operating in hot climates, and, during both the acute stage and the convalescence, the diet is usually restricted to tinned milk and invalid foods, all of which may be regarded as vitamine-free. Mention is made below of the possibility that intestinal affections may in some cases prove a predisposing cause of deficiency disease. It is, therefore, highly desirable that all supply of vitamine should not be cut off during such an illness. Fresh eggs, which provide anti-neuritic vitamine and are also well suited for an invalid diet, are seldom obtainable, and we would, therefore, strongly recommend that dried eggs should be freely used as a substitute. Both commercial samples examined by us were found to be very rich in anti-beri-beri vitamine, they were soluble and could be taken raw, and, when cooked, they made excellent and very palatable dishes.

#### PREVENTION OF SCURVY.

It is a platitude that scurvy can be prevented by the inclusion of fresh vegetables and fruit in a dietary. These are frequently impossible to obtain under the conditions of active service. It is, therefore, our intention under this heading to treat only of such substitutes as are convenient for transport, and hence suited to the needs of armies in the field.

**Germinated Pulses as a Substitute for Fresh Vegetables.**—The most important fact that has emerged from the study of experimental scurvy is the discovery of Fürst (1912) that the anti-scorbutic vitamine, absent or deficient in the resting seed, makes its appearance in the early stages of germination. In our own experiments with peas and lentils, these were first soaked in water for 24 hours, the temperature ranging from 50° to 60° F.; at this stage a small amount of anti-scorbutic vitamine could already be detected. After germination for a further 48 hours, with access of air, the vitamine content had increased five to six-fold, and at this stage the germinated material may be considered the equal of fresh vegetables as regards its anti-scorbutic value.

It is difficult to imagine any circumstances in which this form of anti-scorbutic food could not be made available. In the dry form, peas, beans, lentils and other pulses contain only 10 to 15 per cent. of water, and are eminently suited for transport. They are commonly included in the active service dietaries of armies, and



in the case of Indian troops, as "dhal," form a considerable proportion of the daily ration. The only change needed is that these pulses should be issued in the unmilled (not husked or split) condition, and should retain the original seed coat. Then, in case of unavoidable shortage of fresh fruit or vegetables, a substitute could be made immediately available on the spot by germinating the pulses included in the stores.

The whole operation consists of a preliminary soaking, in which the seeds absorb over 100 per cent. of their original weight of water, followed by germination; after this the food should be cooked and eaten as soon as possible. The time taken by the complete operation could be reduced to 36 hours in a hot climate. In Appendix I below, p 178, a set of directions is given, which may be found a useful guide for preparing these germinated pulses in the field.

It is very important that the peas, lentils, etc., should be cooked and eaten as soon as possible after germination, and should not be allowed to dry again. In the process of drying, the anti-scorbutic vitamin developing during the germination, will be destroyed. Having regard to the sensitiveness of this vitamin to high temperatures, it is also important that the pulses should not be cooked longer than is necessary to render them soft and palatable. A period not exceeding 1 to 1½ hours should suffice for peas and about half an hour for lentils. No deterioration in flavour can be detected after germination has taken place.

Dry pulses contain a high proportion of anti-beri-beri vitamin, and this was found by Grijns\* (1901) to be lessened in amount as germination takes place.

We found that in the early stages of germination an abundant supply of anti-beri-beri vitamin was still retained by our peas and lentils. Dramatic cures of pigeons with acute polyneuritis were obtained with moderate doses (5 to 10 grams) of peas and lentils germinated to the stage, shown in Fig 6, in which condition we were using them successfully for the prevention of scurvy.

*Freshly germinated pulses (or cereals), therefore, occupy a special position among foodstuffs in being richly endowed with both the anti-scurvy and the anti-beri-beri vitamin.*

**Vegetables.**—Among vegetables the onion is marked out as being specially suited to the need of troops, owing to its great resistance to adverse conditions during transport and to the length of time it will remain wholesome. The anti-scorbutic value is comparable with that of fresh cabbage and its flavour gives it more value as a culinary adjunct than is possessed by any other vegetable.

Potatoes were found to be somewhat inferior in anti-scorbutic properties to cabbage, onions, etc. They are more suitable for transport and keep better than most vegetables, and there is no doubt that they have been proved of great value for the prevention of human scurvy. It must be remembered, however, that the amounts consumed are rather large. In one Irish workhouse the daily ration of potatoes is 3 lb.; after a careful study of convict diets, Dr. Guy concluded that 14 oz. daily would protect from scurvy, the rest of the ration including 1 oz. of other fresh vegetable and 4 oz. of meat. Outbreaks of scurvy have repeatedly followed failure of the potato harvest in countries where potatoes are a staple article of diet. *e.g.*, Norway in 1904 (Holst, Frölich, 1912) and Ireland in 1847 (Curran). The

\* Captain Cook, whose long voyage (1772–1775) was notable for the continued good health of the sailors, always took with him a large supply of malted barley. He had the greatest belief in the anti-scorbutic value of a freshly made infusion (sweetwort) and served it out to his men in case of need ("Captain Cook's Voyage," *Everyman Edition*, p 227).

Some Chinese are accustomed to take part of their daily rice in the germinated condition, and this custom has spread to the Malay States (private communication from Brigadier-General Anderson) and Dutch Indies (Grijns, 1901), where "ptowgay" or germinated pulses are regularly taken. There appears to be no evidence, however, that the anti-scorbutic properties of these foods have been appreciated.

recent appearance of scurvy in Glasgow and Newcastle and Manchester is no doubt to be attributed to the great scarcity of potatoes during the last three or four months.

**Fresh Meat.**—The expressed juices of fresh meat gave disappointing results in the prevention of guinea-pig scurvy, but there is no doubt that human beings can be protected by its regular use. This is one of the cases which suggest that the guinea-pig is much more susceptible to scurvy than is man, an opinion also held by Holst and Frölich (1912). Many clinicians believe fresh meat juice to be capable of curing infantile scurvy, and in many Arctic expeditions where scurvy has been escaped, fresh meat of various kinds has been the only anti-scorbutic material present in the diet.

The following incidents are related by Jackson and Harley (1900):—Six Russian priests spent the winter in a hut at Kharborova, Yugor Straits, with a small Russian boy to wait upon them. Their religion would not permit them to eat reindeer or such meat; they subsisted largely on salted fish, and there were no vegetables. In the following May the little Russian boy was found to be the only surviving person in Kharborova; he was subject to no religious restriction and ate reindeer meat during the winter. Jackson himself, living among the Samoyads in Waigatz, 1893–1894, noted that among those of the population who winter on the island, and get neither vegetables nor lime-juice, but live largely on fresh reindeer meat, scurvy is unknown. Some Samoyads, however, migrate with Russian peasant traders, and spend the winter near the large rivers in north-east Russia where the diet consists largely of salt fish; among these scurvy is prevalent.

There is no doubt, however, that animal tissues are distinctly inferior in anti-scorbutic properties to those of fresh fruit or vegetables, and that a large and regular ration is necessary for safety. This opinion was expressed by many witnesses in the Admiralty Enquiry\* upon the outbreak of scurvy in the Arctic Expedition of 1875, and in the older literature many instances occur in which an apparently liberal meat ration did not prevent scurvy. Curran (1847) describes three cases admitted to Swift's Hospital, Dublin, in the great Irish epidemic of 1847, where the previous diet had included ½ lb. on five days of the week. Colonel Hehrt, in a report suggesting needed reforms in the Indian soldiers' diet in Mesopotamia as early as April, 1915, expresses great doubt whether the authorised meat ration of 28 oz. weekly is sufficient to prevent scurvy unless more meat is added and the vegetable ration (2 oz potatoes) is increased. If dry weight is taken into account in comparing the anti-scorbutic value of meat and vegetables, 4 oz. meat must be regarded as the equivalent of at least 10 oz. vegetables. The British troops during the siege of Kut-el-Amara were doubtless protected from scurvy by their meat or horseflesh rations, but these were very abundant (8 oz. to 20 oz. daily).

**Milk.**—Fresh cow's milk was found to possess very low anti-scorbutic value in feeding guinea-pigs; satisfactory protection from scurvy was only attained by a large ration, about 100 c.c. daily. It is probable that infants living upon cow's milk do not receive any great excess of vitamin. As regards adults, Curran (1847) instances upwards of 80 cases admitted to the Dublin Union Hospitals in the Irish epidemic of 1847; all had been inmates of the Union for at least six months previously, and the diet, though deficient in vegetables and meat, had included at least one pint of milk daily.

We have, nevertheless, been much impressed with the great value of milk, even when heated to 120° C. for one hour to destroy the vitamins, as an adjunct to diet. The general condition of animals who received a

\* "Report of the Lords Commissioners of the Admiralty upon the Outbreak of Scurvy in the Recent Arctic Expedition." London, 1877.

† Mesopotamia Report, 1917. X. 41.

minimum amount of anti-scorbutic material could be enormously improved by the addition of a daily ration of this heated milk, although the scurvy was not influenced. Therefore, while admitting that milk is of little importance for the prevention of scurvy (or beri-beri), its inclusion in a diet, even when tinned and sterilised, would appear to be a very valuable measure.

*Fruit.*—Fresh fruit juices appear to be among the most valuable anti-scorbutic materials we possess. In our experimental work fresh orange and lemon juices were found very potent. There is also abundant evidence, dating as far back as the beginning of the seventeenth century,\* of their value in the prevention of human scurvy. In 1795, largely due to the efforts of Sir Gilbert Blane (1785, 1830), a regular issue of lemon juice† was ordered in the Navy, and a remarkable decrease of the death-rate was the result. Budd (1840) states that, whereas 1,457 cases of scurvy were admitted to the Royal Naval Hospital at Haslar in the year 1780, no case was reported in the years 1803 to 1810.†

The juice of limes has also been widely esteemed in the past as an anti-scorbutic. There is not, however, much trustworthy evidence as to the anti-scorbutic value of lime-juice when preserved according to modern methods. We have so far found it disappointing for the prevention or cure of guinea-pig scurvy. Holst and Frolich (1912, p. 96) on the other hand, demonstrated distinct anti-scorbutic properties in two commercial samples of lime-juice, purchased in retail shops in Christiania.

#### SUMMARY.

1. To maintain a human being in a satisfactory state of nutrition the diet must contain :—

(a) A suitably proportioned supply of protein, fat, carbohydrate, salts and water, and

(b) An adequate amount of accessory food factors, or vitamins.

Both (a) and (b) are required; excess of one cannot make good any deficiency in the other.

2. These necessary vitamins are, at least, of two kinds: firstly, the anti-neuritic or anti-beri-beri vitamin, deficiency of which in a diet occasions beri-beri; and, secondly, the anti-scorbutic vitamin, deficiency of which occasions scurvy.

3. Neither of these vitamins has yet been isolated in a pure state, and, for the moment, their presence can only be detected by biological methods.

4. These two classes of vitamins have each their individual rôle in metabolism; they possess properties different from each other and are differently distributed among natural foodstuffs.

5. The distribution of the anti-beri-beri vitamin has been investigated by study of experimental polyneuritis in birds, which is generally accepted as analogous to human beri-beri. Pigeons, if deprived of anti-beri-beri vitamin (e.g., on an exclusive diet of polished rice or white flour, etc.), develop acute polyneuritis (beri-beri) in fifteen to twenty-five days. The presence and relative amount of the anti-neuritic vitamin contained in various foodstuffs has been determined by means of curative experiments, and by preventive trials with specially selected diets. In this work we have extended the observations of Cooper (1913-14), and have, in general, followed his methods.

6. The anti-beri-beri or anti-neuritic vitamin was found in almost every natural foodstuff examined. The principal source is in the seeds of plants, e.g., cereals and pulses. The most important result emerging from the present work is the fact that in cereals the anti-beri-beri vitamin is mainly deposited in the germ or embryo of the grain, and to a less extent in the bran. White wheaten flour or polished rice, which consist of the endosperm (minus aleurone layer) of the grain are

deficient in this vitamin, and if employed as sole diet will occasion polyneuritis in pigeons or beri-beri in man.

Other important sources of anti-neuritic vitamin are the eggs of animals (e.g., hens' eggs or fish roe) and yeast or yeast extract. Milk and cheese gave disappointing results (Cooper, 1914).

7. From the abundant presence of the anti-beri-beri vitamin in dry foodstuffs it is clear that this substance is resistant to drying. It can also withstand exposure to temperatures in the neighbourhood of 100° C. for two hours without significant loss; if heated under pressure to, or near, 120° C. destruction takes place more rapidly.

8. The distribution of the anti-scorbutic vitamin has been investigated by a study of experimental scurvy in guinea-pigs. We have followed the methods of Holst and his co-workers (1912) with some modifications. A diet of cereals with water or sterilised milk will cause death from acute scurvy in these animals within a month. The influence of various foodstuffs in preventing scurvy when added to this "scurvy diet" has indicated where the principal sources of the anti-scorbutic vitamin are to be found.

9. The anti-scorbutic vitamin is present in active living vegetable tissues. It is also present in animal tissue, to a much less degree. Fresh vegetables and fresh fruit juices are the most valuable sources of anti-scorbutic vitamin that we possess. All the dried foodstuffs examined, including desiccated vegetables, were more or less deficient in this vitamin.

10. Dry pulses (or cereals) though rich in anti-beri-beri vitamin are deficient in anti-scorbutic vitamin, and afford no protection against scurvy. If these are moistened, however, and allowed to germinate, the anti-scorbutic principle is regenerated with the beginnings of active cell life.

*Germinated pulses are recommended as a valuable and convenient means of preventing scurvy in the absence of fresh fruit and vegetables.* In the dry stage they are eminently suitable for transport and can be moistened and germinated on the spot as required. In Appendix I is given a method for preparing germinated lentils or peas under active conditions.

11. It is evident from 9 and 10 that the anti-scorbutic vitamin is extremely sensitive to drying. As regards exposure to high temperatures, it is also more unstable than the anti-beri-beri vitamin. Holst (1912) found that the anti-scorbutic power of fresh cabbage was slightly lessened after exposure to 100° C. for half an hour, but that the deterioration was appreciable after one hour; at 110-120° C. the destruction was rapid and complete.

12. It follows from 7 and 11 that neither the anti-neuritic vitamin nor the anti-scorbutic vitamin may be expected to survive in tinned or sterilised foods, considering the high temperature to which these have been subjected in course of preparation.

13. In case of armies or other populations subsisting largely on tinned food, it is imperative to provide adequate supply of vitamin from outside sources.

*To prevent beri-beri, the bread or biscuit should be made from whole-meal or germ-containing flour.*

*To prevent scurvy, if a supply of fresh fruit or vegetables is not procurable, germinated pulses should be added to the diet.*

## ANNUAL REPORTS.

THE ASSAM SANITARY REPORT, 1916.\*

MAJOR T. C. McCOMBIE YOUNG, I.M.S., the Sanitary Commissioner, Assam, has submitted a very interesting report on the good work done

\* James Lind. "A Treatise on Scurvy," 2nd Ed. London, 1757.

† In 1810, the daily ration of lemon juice was 1 oz. and 1½ oz. ugar, issued two weeks after leaving land. (Budd, 1840.)

[\* These notes have been held up for some time owing to the pressure on our space.—ED., I. M. G.]

in Assam during the past year—from which we make the following extracts:—

In the absence of an officer who can give his time to the elucidation of the causes which lead to the prevalence of malaria in the province, and in view of the financial stringency entailed by the war, the consideration of special measures aimed at the reduction of malaria has had to be abandoned for the present. The growth in the sale of Government quinine, which is offered at rates which are much below those at which the drug is obtainable in the open market, is however an encouraging antimalarial measure.

year. Our operations in this area have been continued and it was decided to remove nine families to new house sites. The other villages in this area in which we had in previous years carried out segregation operations, remained free from the disease, no fresh cases having been discovered in them during the year.

A serious outbreak of kala-azar came to light in a tea garden in this area. The original source of the infection is obscure, but it seems probable that it was imported some years ago from one of the infected villages already mentioned. During a period of nine months, sixty-eight cases had come under observation, of whom twenty-three had died. Measures providing for the segregation of

### Kala-azar.

| Districts.    | 1907. | 1908. | 1909. | 1910. | 1911. | 1912. | 1913. | 1914. | 1915. | 1916. |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1             | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    |
| Cachar ...    | 22    | 5     | 6     | 2     | 3     | 2     | 8     | ...   | 2     | ...   |
| Sylhet ...    | 576   | 561   | 454   | 866   | 549   | 394   | 444   | 203   | 159   | 63    |
| Goalpara ...  | 49    | 32    | 81    | 87    | 135   | 192   | 206   | 138   | 55    | 106   |
| Kamrup ..     | 516   | 386   | 378   | 450   | 354   | 385   | 291   | 215   | 283   | 277   |
| Darrang ...   | 845   | 649   | 643   | 627   | 679   | 563   | 399   | 317   | 310   | 320   |
| Nowgong ...   | 208   | 146   | 140   | 321   | 285   | 108   | 417   | 393   | 419   | 451   |
| Sibsagar ...  | 11    | 2     | 1     | ...   | 34    | 31    | 29    | 24    | 5     | 28    |
| Lakhimpur ... | ...   | 5     | ...   | 50    | 11    | ...   | 1     | 8     | ...   | 3     |
| Total ...     | 2,227 | 1,786 | 1,703 | 2,303 | 2,051 | 1,875 | 1,798 | 1,298 | 1,233 | 1,248 |

The mortality returns in the aggregate vary little from those of the preceding two years.

Examining the district figures in detail, Nowgong shows a higher mortality than has been recorded for the last ten years and from these figures there appears to be some tendency to increased activity of the disease. In reviewing this apparent increase, it is noteworthy that the Civil Surgeon, Dr. Dodds Price, points out that the birth-rate has, in 1916, exceeded the death-rate by 3.19 per 1,000, and he considers that the district is now to some extent recovering its vitality which was so seriously damaged during the years when kala-azar was epidemic. Major Mackie's observations in 1912 and those of the provincial survey of 1912-13 showed that the incidence of the disease is now greatest during childhood. An increasing birth-rate therefore must lead to the presence of a larger number of susceptible persons in the population, and other things being equal, to a proportionately increase in the number of cases of kala-azar, without any concomitant increase in the virulence of the endemic. Registration has also improved in this district and fewer cases now escape record. From these considerations, and taking into account the information derived from our travelling dispensary reports, it does not appear probable that any disquieting degree of activity of the disease is making its appearance, although it is to be regretted that the continued presence of the endemic must to some extent retard the recovery to which Dr. Dodds Price has alluded.

In Darrang there is a small increase over the figures for the last two years which, however, does not fully display the undoubted increase of activity which we know from the reports of our travelling dispensaries is taking place in some parts of Mangaldai.

The disease has also been rather active in the endemic centres in Goalpara as compared with last year. In Kamrup there was little change. In the district of Sibsaagar a larger number of deaths have been reported than in the previous year, and in the Golaghat subdivision of this district, in three infected villages of Bati-paria Lukumani, Domjuria, and Khongia, fourteen new cases were discovered as against twelve in the previous

infected and suspected families, for the destruction of the infected houses and for the reconstruction of new lines on an uninfected site have been taken, and the Local Administration was advised to apply for powers under the Imperial Epidemic Diseases Act of 1897 (III of 1897) to prevent migration of infected persons in the event of panic or discontent arising among the labour force as the result of these measures. After the close of the year sanction was accorded to these proposals, the details of which are now under the consideration of the Local Administration. If these measures of segregation, removal, and prevention of migration are effectively carried out, there is no need to fear an extension of the disease to the labour forces of other tea estates, a contingency whose disastrous potentialities for the tea industry of the province are obvious. It may be added that the Directors, Manager, and Medical Officer of the infected garden are fully alive to these possibilities and are taking all necessary steps to give effect to the recommendations which experience has shown to be required for dealing with such outbreaks.

Measures of segregation and removal of infected villages have also been taken up in two badly-infected villages in the Nowgong district, and in two villages in Kamrup.

The policy we have followed is to endeavour to institute such measures in villages which from the reports of our travelling dispensary staff are found to be badly affected, as both from a humanitarian and from a public health point of view, it is undesirable to allow their inhabitants to remain on a badly-infected site until depopulation terminates the outbreak with the possibilities of spreading an acute form of the disease meanwhile. The help thus offered by Government is usually gladly received and, with the co-operation of the district administration, little or no unwillingness to move is experienced. The main difficulty is usually that of finding suitable 'busti' land for the site of the new villages and where this can be overcome, the removal is fairly easily arranged.

Four travelling dispensaries each in charge of a sub-assistant surgeon and provided with pony pack transport.

the whole under the immediate supervision of Assistant Surgeon Suresh Chandra Majumdar, were at work for varying periods of the touring season. Regular weekly reports were received from them, from which it appears that medical and surgical advice was given by them to 5,185 persons.

During the rainy season, one of the sub-assistant surgeons on *kala-azar* duty, Sasi Kumar Das, under the supervision of Assistant Surgeon Suresh Chandra Majumdar, carried out an enquiry into the water-supply and health conditions of certain villages in the Habiganj subdivision, in regard to which a careful and interesting report was submitted by Suresh Chandra Majumdar.

#### EMIGRATION TO LABOUR DISTRICTS.

Twenty-one thousand nine hundred and forty-nine emigrants passed through Naihati and Amingaon by rail to the labour districts, and among them there were seven cases of sickness and five deaths.

During the year the Travelling Inspector of Emigrants has been, as usual, engaged in the supervision of the medical and sanitary conditions under which emigrants travel to Assam. He is concerned with the steamer route from Goalundo to Assam, and from Goalundo to Chandpur, and also with the arrangements on the Assam-Bengal Railway and Eastern Bengal Railway. In regard to the part of his beat which is on the Eastern Bengal Railway, some ambiguity exists in regard to how far he should travel, as Saraghat, which was the limit of the jurisdiction of this department prior to the opening of the Sara Bridge, is no longer a place of halt. It is desirable that his jurisdiction should be extended to Naihati, as it is from that station that the journey to Assam commences, whether by rail or steamer, to the Assam Valley, or to the Surma Valley.

Endeavours have been made to discover the causes of disease and mortality occurring *en route*, and to improve the conditions under which emigrants travel. An informal conference was held in Calcutta in April, 1916, with the Agent, Eastern Bengal Railway, at which a representative of Messrs. Begg, Dunlop & Co. was present on behalf of the Tea Districts Labour Supply Association. After discussion of our aims, it was arranged that the Eastern Bengal Railway would build feeding sheds at Santahar and Golakganj, and a special hospital at Amingaon for the accommodation of emigrants, and that when these arrangements are completed, a special coolie train would be run from Naihati, halting at Santahar and Golakganj for the supply of a hot meal, the cost of which would be included in the fare. These arrangements are now approaching completion, but it is not known to what extent the curtailment of railway facilities entailed by the war will delay the inception of these arrangements.

Several questions affecting emigration were discussed with the Chairman, Assam Labour Board, and with the representatives of the Tea Districts Labour Supply Association and in regard to the occurrence of cases of small-pox and the desirability of vaccinating all emigrants prior to the commencement of the journey it was arranged that although wholesale vaccination was for various reasons undesirable, on the receipt of information regarding a case of small-pox occurring *en route*, arrangements would be made by the forwarding agents for the vaccination by the local agents of all labourers recruited in the area from which the infected person had come.

Attention was also directed to the arrangements on the steamer routes. The steamer companies have

revised the medical equipment of their steamers and this now includes a simple apparatus for the administration of hypertonic saline injections for cholera. Their medical officers have been trained in the technique of administration of these injections by Dr. P. Ganguli, the Embarkation Agent at Goalundo, and it is hoped that this treatment will reduce the mortality among cholera patients on steamers, who can thus receive at an early stage a treatment which had formerly to be delayed until the patient was installed in a cholera hospital.

#### THE BURMA SANITARY REPORT, 1916.

LIEUTENANT-COLONEL C. E. WILLIAMS, I.M.S., the Sanitary Commissioner, Burma, though handicapped by the reversion to military duty of a large proportion of his staff, has managed not only to keep up the standard of efficiency but also to submit an interesting report of the year's working, from which we make the following extracts.

The subject of Infantile Mortality is one to which great attention has been paid in Burma of recent years. The Sanitary Commissioner writes as follows:—

In 1916 a Circular letter was addressed by the Sanitary Commissioner to all Health Officers pointing out the desirability of ascertaining as exactly as possible the correct infant mortality of urban areas by tracing the history of all infants born in the town within 12 months, to the end of the first year of life, or until death within that period. By this method the true mortality rates of as many infants born in a town and within a 12-month period, and remaining under observation up to death or till the end of the first year of life, can be ascertained, and the disturbing influences of immigration and emigration of infants will be avoided. Dr. Mullan responded by tracing the after history of a large proportion of the infants born and registered in Mandalay city during 1915. Out of 4,851 live births in 1915, he found that 355 infants had left the town and 1,637 had died within the first year of life, while 2,859 had survived to 12 months of age. Thus, out of 4,496 infants who remained in the town 1,637 died, giving a death-ratio of 364.1 per mille of births. This compares favourably with the infantile death-ratios for 1915 and 1916, *viz.*, 449.2 and 443.3 which were calculated in the ordinary way, as a ratio per mille of registered deaths against registered births; and tends to support the present writer's conviction that the infantile death-rate of Mandalay is overstated and is due to under-registration of births and perhaps also to immigration of a considerable number of infants born outside the urban area, whose deaths were recorded by the Municipal registration agency. The statistics also showed that the infantile death-rate varied with the month of birth being lowest (287.29 per mille) for infants born in March, February (305.9), January (310.9), and December (313.02); and highest for those born in June (461.96 per mille), September (435.16), October (402.27), and July (398.86). The months returning the highest numbers of births were January (431), November (420), and May (413), and the lowest August (325). The deficiency in registration of births in Mandalay is shown by the following figures. The deaths were registered of 260 infants whom subsequent enquiry showed to have been born in Mandalay within the year and whose births were not registered; 625 living infants born in Mandalay but not registered were detected by the registration staff.



## Correspondence.

### BITE FROM *ECHIS CARINATA*: RECOVERY.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

At Datia, a female child, aged five years, was bitten on the inner side of the left thumb by a snake at 5-30 P.M., 29th March, 1915, while playing about outside.

The father on hearing the child cry came out and found a snake encircled about the child's hand.

The reptile was killed, and a ligature was applied to the middle of the arm, and the patient brought to my bungalow.

On returning home, I saw the child, at 7-30 P.M., two hours after the bite. On examining the her, I found:—Two punctured wounds on the thumb and swelling of the whole of the hand as far as the wrist. This was not caused by the ligature, as it was found to be loose. The child complained of pain in the hand and arm.

GENERAL CONDITION:—The child was pale and inclined to be drowsy, she liked to be left alone, but I could not see any signs of paralysis; pulse 110, respiration 20.

I cleaned the thumb with hot Iodine Solution but did not interfere with it, thinking it was too late for any local treatment such as puncture, etc.

Internally, the child was given two tea-spoonfuls of Vinum Galici every two hours.

She passed a restless night, and complained of pain all the night.

Next morning, on the 30th, the whole arm was found swollen and there was also slight swelling in the left axilla. The swollen parts were hot and painful and it appeared as if there would be cellulitis of the whole arm and forearm.

The child was restless but there was nothing remarkable in her general condition; pulse rate 112, temperature 98.6°, respiration 19.

During the day the child slept well, and appeared better.

On the morning of the 31st the swelling was decidedly reduced and the part less painful. By the fourth day the child was better and walking about.

The snake was brought to me on the morning following the accident. Fortunately its head was not mutilated, as is usually the case, and it was identified by me as *Echis Carinata*. I did not think it necessary to send the snake for further confirmation as I was sure of its identity. I give the following details about it:—

Length,—14"

Tail,—13"

Head,—Broad.

Eyes,—Colour of iris could not be seen properly.

Teeth,—A long fang on both sides.

Head shields,—Head was completely scaly, excepting a pair of sublinguals, a small single nasal, and 2 inter-nasals.

Ventrals,—About 150, broad. The exact number could not be counted as the snake was badly mutilated about the body.

Anal,—Entire.

Subcaudals,—Single, 32.

Colour,—Brownish.

Belly,—White, distinctly spotted.

CONCLUSION,—The child was undoubtedly bitten by an *Echis* and poisoned, for there was nothing else to account for the swelling of the whole arm and part of the axilla. But absence of any general symptoms of poisoning would make us think she received a sublethal dose.

Though Datia abounds in cobras and karais, this is the first time that I had an occasion to see a case of *Echis* bite.

K. ARDESHIR.

### LATHYRISM-LIKE DISEASE (DUE TO *BAJRA*).

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR.—In the February, 1918, issue of the *Indian Medical Gazette* (on page 61,) there appeared an article on Lathyrism. This disease, as is generally known, is caused by the ingestion of diseased food-grains. The food-grains so far generally known to give rise to this disease in man are diseased [*Ed.*] rice, which produces Beri-Beri, and another fungus which grows on rye. The writer of the article in the *Indian Medical Gazette* also now refers to certain peas and a kind of pulse, the exclusive use of which may give rise to this form of spinal trouble. Apart from these, I have not heard nor seen mentioned in text-books other food-grains which give rise to this disease. The writer of the articles also says that the disease is always an accompaniment of famine or scarcity, due to the fact that this grain, which can grow under adverse conditions, is then most largely used by poor people. Within the last few months, however, there appeared a curious, though serious, disease in two tahsils

of this State which caused a considerable number of deaths there. This disease seemed to be caused by the ingestion of diseased *bajra* (maize). *Bajra*, however, is the staple article of diet in these places and has always been used by the people there. As it may be interesting to the profession to know something about it, I trust you will kindly allow a short space in the next issue of the *Indian Medical Gazette* for a brief description of it. The symptoms are as follows:—First of all, the patient feels pain in the region of the stomach near the præcordia; the pain gradually gets severer and extends upwards along the middle of the chest up to the throat, and then, finally, after a feeling of constriction of the throat the man dies. Death usually takes place very rapidly; some cases die within a few hours, while others linger for 3 or 4 days. There was generally no fever. All ages and both sexes were attacked, but usually the lower class people and those of low vitality were affected.

The disease assumed a very virulent form. It was found that those who used fomentations over the painful parts and had vomiting and purging, mostly recovered even without medical aid. In convalescent cases there were marked pains in the nerves of the legs in many instances cases. There was great weakness and feeling of severe cold and numbness in the extremities, the legs were more severely affected than the arms. This was accompanied by hyperæsthesia of the parts above. Later on, the patient complained that he was paralysed and he could not even move his limbs except with the greatest difficulty. The paralysis however was not complete. He could feel a pinch or even a finger placed on the skin of his legs. There was not much stiffness, and the deep reflexes were present in some cases, while in others they were absent. The pulse of all the patients was weak, and constipation was generally present. In the later stages of the disease, there was œdema of the face and ankles.

It was noticed that mostly these villages were affected that are situated at the foot of the hills and where the inhabitants used mostly *bajra* as their food. *Bajra* is the staple article of diet in these places. Villages situated at the top of the hills, with rice as the staple food, instead of *bajra* were much less affected.

I visited several villages thus affected and saw many cases of this nature. The following line of treatment was adopted. I gave ordinary purgatives to clear the bowels, and administered antispasmodics, heart tonics and stimulants. I also used thorough fomentation and massage. As regards diet, I gave only milk or milk and wheaten flour. I stopped *bajra* altogether. Under this treatment marked benefit was obtained. I was particularly pleased to see a case of a man who was formerly in extreme suffering and could not even move in his bed, but who only after three days' treatment walked some two miles to another village to see me. He made a wonderful recovery. The Sub-Assistant Surgeon at the other tahsil was also advised as to treatment, and the report shows that the same treatment proved equally good there.

I could stay at the effected places only a few days, and after my return, as there was no Sub-Assistant Surgeon available at the time, the State authorities sent a *hakim* to the affected villages—where there was no proper medical man to give relief. He also adopted the same line of treatment and was successful. He also stopped *bajra*, and substituted milk and wheat.

The Revenue Deputy Collector of the State had also accompanied me on my tour to these villages, and on our recommendation, in addition to medical help, the State authorities also afforded much needed relief in the form of clothing and monetary grants to the sufferers; this, too, proved very beneficial. It was first thought that the water of the Chambal river, which is the chief source of water supply of these affected villages, might have something to do with the disease, but later it was found that many other villages escaped which got their water from the Chambal but which did not use *bajra* as their chief article of diet. Hence I came to the conclusion that *bajra* must have been the cause. I may also mention that it is generally admitted that the *bajra* produce of these affected villages was not good in quality this year, probably owing to the excessive rainfall. The disease appeared after the rainy season, when the new crop came into use. It is possible that some toxic substance is formed in the *bajra*, which produced the disease. The poison seems to act powerfully on the heart. It may be that the severe pain in the chest and the feeling of constriction in the throat are due to powerful spasmodic contractions of the heart and the aorta, and death takes place from heart failure. By the use of cardiac tonics and stimulants and fomentations the muscle fibres are relaxed and thus there is relief from the pain. Similarly, by fomentations and massages over the extremities the circulation is restored, and improvement takes place. By the use of emetics and purgatives the poison is eliminated.

It may also be mentioned that samples of the *bajra* produce of these villages were sent for chemical examination but the result was negative. The Chemical Analyser wrote:—"No poisonous principle could be detected on analysis of



any of the nine samples. Extracts injected into frogs, produced no toxic effect. Chemical analysis may, however, sometimes fail to reveal the presence of the poisonous principle in food-grains, as has been the case with *kodo*. It may also happen that in cases of food-poisoning the offending substance may, to all physical taste, appear to be good and wholesome."

It may also be noted that prior to the commencement of the treatment on the lines stated above, the rate of mortality from this disease in the affected villages was 50 to 80 per cent. in the two *tahsil*; whereas when treatment was adopted the rate of mortality very soon fell between 15 to 20 per cent. at both the places. Also, when the *bajra* was removed from the villagers' diet the number of fresh cases, too, became reduced automatically.

The above are only my views. I shall be glad to know whether other medical men have also had experience of such cases, and what their opinions are about this disease. At any rate, this is a very uncommon disease. Medical men at this place, both *hakims*, *vaids* and those practising on Western lines, say that they have never met such cases before. Text-books are silent on it. I therefore request that further light may be thrown on the subject, and also whether any account of it is mentioned in any text-book.

The chief points of interest about the disease are the following:—

(i) Its prevalence in a virulent epidemic form in human beings, resulting in many deaths. Hundred of persons had been affected.

Few cases of this nature have yet been recognised in man.

(ii) The disease ran a very acute course. Death occurred very rapidly. In *beri-beri* the action of the poison is gradual and accumulative and the course of the disease essentially chronic.

(iii) Relapses were found to occur very rarely.

Yours, etc.,

MOHABIR SAHAYA, L.M. & S.,

April, 1918. Asst.-Surgn., Karanti State, Rajputana.

#### QUININE UREA HYDROCHLORIDE.

To the Editor of "INDIAN MEDICAL GAZETTE."

SIR,—In reply to the inquiry re the use of quinine urea hydrochloride in the *Indian Medical Gazette* of November, 1917, I have been able to gather the following information. "Quinine-et urea hydrochloras is suitable for hypodermic injection. It dissolves in its own weight of cold, distilled water, and the solution can be injected in 5 to 20 minim doses. It is a powerful local anæsthetic, like cocaine."

Whitla's "Materia Medica and Therapeutics":—

Quinine urea hydrochloride in from  $\frac{1}{4}$  to 1 per cent. solution causes prolonged local anæsthesia. A solution of 1 per cent. is too strong—it causes the wound to heal slowly and produces induration. The drug has no toxic effect and can be used in considerable quantity; it lessens bleeding, and by producing an effect for many hours lessens post-operative pain. Quinine urea hydrochloride is used by infiltration. It is dissolved in water or normal salt solution."

Da Costa's "Modern Surgery":—

For details of infiltration method of producing local anæsthesia, a reference may be made to this book, page 1218. I shall be much obliged for further particulars of this method, under which Da Costa says he has operated with satisfaction in the following cases:—

Gastrotomy, tracheotomy, rib resection, goitre, tuberculous glands of the neck, drainage of a cerebral cyst, ligation of thyroid arteries, inguinal colostomy, typhoid perforation, abscess of the lung, chronic and acute appendicitis, appendiceal abscess, jejunostomy, radical cure of inguinal, femoral and umbilical hernia, resection of the bowels, amputations of arm, thigh and leg, removal of stone from the pelvis of kidney, hysteropexy, etc.

Yours, etc.,

B. SRINIVASACHARI,

B.A., L.M. & S.

KALLAKURCHI, }  
S. ARCOT DISTRICT. }

#### A CASE OF SACCULATION OF THE BLADDER CONTAINING A DUMB-BELL-SHAPED CALCULUS.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—A boy, aged 12 years, was brought, to the Civil Hospital, Blunj. for difficulty of micturition, &c. A sound was passed, and a stone in the bladder was diagnosed. The patient was apparently in intense pain and stooped a good deal while walking. After the usual preparations, the patient was put on the table for operation. It was proposed to do a litholapaxy. When the patient was under chloroform a canula was passed. It would touch the stone but would not go into the bladder up to its usual length. The boric lotion which was injected in the bladder would go in very slowly and would not return easily. A lithotrite No. 8 was passed. It would touch the stone but would not enter the

bladder. It was naturally presumed that the stone was a very big one and that it occupied greater part of the bladder. Unfortunately, examination with a finger per rectum was



not made, otherwise it may have given some clue to the condition. A supra-pubic was decided upon, and bladder was exposed as usual. Greatly distended veins were found on the outer surface of the bladder wall, suggesting long-continued obstruction to the flow of urine. Bladder was opened and finger passed. A stone about the size of a large betel-nut was felt and removed. While feeling for this stone, a sharp object was felt in the bladder. After removal of the first stone an effort was made to search for that sharp-pointed object. It was found that the sharp-pointed object was nothing else but the end of another stone, which was lying deeply embedded in a sacculi. This sacculi was situated in the trigone of the bladder, just behind the opening of the urethra. It had a distinct os, which contracted strongly whenever an effort was made to pass the finger into the sacculi. All the manipulations to dislodge the stone from the sacculi proved futile. At last pressure with a finger in the rectum succeeded in driving the stone into the cavity of the bladder, whence it was easily removed. On examining the two stones, it was found that they were only the broken pieces of one stone. The shape of the whole stone can hardly be compared to any object, but to give some faint idea of its shape to the readers it can be called dumb-bell-shaped. One rounded end of the dumb-bell was lying in the sacculi, the handle-like portion occupied the os-like portion of the sacculi, while the other round end was growing in the bladder cavity. A photograph of the calculus is sent herewith. The stone was phosphatic in structure, as most of these stones are. The patient made uninterrupted recovery.

Yours, etc.,

JADUNJI HUNSAJ VAIIDYA, I.M.S.,

April, 1918.

Chief Medical Officer, Cutch State.

#### STOMATITIS AND SCROTAL ECZEMA.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Will you please insert in your esteemed journal the following few lines in reply to one of your correspondents on "Stomatitis and Scrotal Eczema" in the March issue of the *Indian Medical Gazette*.

I think neither the stomatitis nor scrotal eczema seen in those patients could be regarded as disease *per se*, but both probably symptoms of some constitutional disturbance. It is well known that many cases of stomatitis occur as the result of some gastro-intestinal disorder, unhygienic conditions like unwholesome food, damp or cold weather, or bad teeth. These same causes give rise to eczema of and around genitals in particular. Somehow eczema of this region, as distinguished from eczema anywhere else, is more often the result of constitutional derangement than of local irritation. In this connection the rôle played by bad teeth is somewhat interesting, as they cause stomatitis by local irritation and give rise to scrotal eczema through causing septic absorption.

As I presume the treatment given to these patients for any one of the affections, as is rational, must have been both local and general, it is easy to understand in the light of the aforesaid how the latter part of the treatment may have sufficed to cure both.

I do not pretend to know why these cases should have particularly occurred in the winter season.

Yours etc.,

K. T. RAMCHANDANI,

Assistant Surgeon,  
MALVAN.

MORAY DISPENSARY, }  
MALVAN, }  
The 19th April, 1918. }

## THERAPEUTIC NOTICES.

ATTENTION is directed to the advertisements of Messrs. K. V. Dhengle & Sons, manufacturers of modern hospital furniture, at 10, Forbes Street, Bombay. Their new catalogue gives a long list of excellent iron and steel hospital equipment, with prices raised, of course, in view of prevailing prices of iron and steel, instrument cabinets of many kinds, dressing cabinets, irrigator stands, many varieties of operating tables, instrument and dressing wagons, washstands, ward-lockers or bedside tables, bedsteads and many other useful articles. Furniture can also be made according to customers' designs and instructions. Medical officers on the lookout for hospital equipment will do well to consult this firm's catalogue.

THE Hoffman-LaRoche Chemical Works, Ltd., 7-8, Idol Lane, London, E. C., inform us that they have been able to make a shipment of a large consignment to India of their well-known preparations, especially *Thiocol "Roche" Powder*. Their Indian agents are Messrs. J. Murray & Co., Ltd., of Calcutta, Madras and Bombay.

MESSRS. LAWRENCE & MAYO, of Calcutta, Madras, Bombay, Delhi and Rangoon, are the Indian representatives for the X-Ray and electro-medical apparatus made by the well-known firm of Newton & Wright, of London.

MESSRS. E. STELLA & Co., Bombay, are agents for India for the biological preparations of the *Mulford Laboratories*, and for Dr. Zambelletti's solution of Salvarsan, and also his *Allylene*.

THE agents for the *Millon Disinfectant* are Messrs. W. Leslie & Co., Chowringhee, Calcutta.

MESSRS. MARTIN & HARRIS, 8, Waterloo Street, Calcutta, are agents for *Esca Syrup* for use in wasting diseases.

MESSRS. J. MURRAY & Co. (P. O. Box 216, Calcutta) are agents for the well-known preparations of the Anglo-French Drug Co., of Holborn, London.

## Service Notes.

THE number of casualties among officers reported during the fourteen days, 27th February to 12th March 1918, inclusive, though still comparatively small, was higher than in the preceding two weeks, and amounted to 576, as follows:—

|           |     |     |     |
|-----------|-----|-----|-----|
| Killed    | ... | ... | 185 |
| Died      | ... | ... | 29  |
| Wounded   | ... | ... | 280 |
| Missing   | ... | ... | 41  |
| Prisoners | ... | ... | 41  |
| Total     | ... | ... | 576 |

The number of medical casualties would have been very small but for the loss of the *Glenart Castle*, which contributed thirteen deaths. As it was, the total was only 21. The names are given below. All, unless otherwise stated, were temporary officers of the R. A. M. C.

*Killed*.—None.

*Lost at Sea*, in '*Glenart Castle*'.—Lieutenant Colonel J. C. Furness (S.R.); Captains A. C. Kelsey, G. W. Young and L. Moysey; Lieutenant J. A. Stainsby; Matron K. Beaufoy; Sisters J. Evans, R. E. Kendall; Staff Nurses E. R. Beresford, E. Blake, E. Edgar, C. E. Henry, and M. Mackinnon.

*Died*.—Colonel J. C. Morgan (A.M.S. Regular); Lieutenant-Colonel A. L. Duke (I.M.S.); Sister L. A. Davis (Canadians).

*Wounded*.—Captains J. C. Heffernan, J. E. Ronaldsen, M.C. (S.R.); F. W. Tidmarsh (Canadians); H. C. Tumble (Australians); Lieutenant A. W. Gill.

The hospital ship *Glenart Castle* was torpedoed by a German submarine, and sunk, in the British Channel, at 4 A.M. on 26th February, 1918, with great loss of life. She was outward bound at the time and had no patients on board, but carried a ship's complement of 120, and 60 medical staff, out of whom 153 were lost. No officers were

among the survivors. The personnel on board were as follows:—

|                              | Saved. | Missing. | Total. |
|------------------------------|--------|----------|--------|
| Ship's Complements ...       | 25     | 95       | 120    |
| R. A. M. C. Officers ...     | 0      | 5        | 5      |
| Nurses ...                   | 0      | 8        | 8      |
| Chaplains ...                | 0      | 2        | 2      |
| R. A. M. C. rank & file, ... | 4      | 43       | 47     |
| Total ...                    | 29     | 153      | 182    |

The *Glenart Castle* has been an unlucky ship. She was formerly the *Galician*, of the Union-Castle line, and in her voyage Home from the Cape, in the first month of the war, was captured by the German auxiliary cruiser *Kaiser Wilhelm der Grosse*. This was before the German Navy had taken to indiscriminate murder at sea, and she was released and allowed to continue her voyage. On arrival in London her name was changed, and she was fitted out as a hospital ship. She started on her first trip as such on 7th November, 1914, with Lt. Col. A. W. Dawson, I.M.S., in medical charge. The following day, in the lower reaches of the Thames, below Gravesend, she was run into by a collier, and a hole stove in her port side, forward. (The writer was on board at the time.) She then had to return to London docks, to be dry-docked and repaired, her staff being transferred to the *Syria*. Subsequently, in 1917, she struck a mine, but was not very seriously damaged.

The names of those lost were:—Lieutenant-Colonel J. C. Furness; Captains A. E. Kelsey, L. Moysey, and G. W. Young; and Lieutenant J. A. Stainsby, all of the R.A.M.C.; Matron K. Beaufoy; Sisters J. Evans and R. E. Kendall; Staff Nurses E. R. Beresford, E. Blake, E. Edgar, and C. E. Henry; all Q.A.I.M.N.S.R.; and Staff Nurse M. Mackinnon (T. F. Nursing Service).

Lieutenant-Colonel James Collins Furness, R.A.M.C., was educated at Glasgow and at Charing Cross Hospital, and took the L.S.A. in 1901, also the L.M.S.S.A. in 1907, after which he settled in practice at Kidsgrove, North Staffordshire, where he was Medical Officer and Public Vaccinator to Kidsgrove and Goldenhill District of the Wolstanton and Burslem Union, Surgeon to the Police and to the St. John's Ambulance Brigade, and County Director of the Staffordshire Branch of the British Red Cross Society. He served with the 25th Field Hospital in the South African War, receiving the medal; and held the honorary rank of Lieutenant in the Army from 1st March, 1903. He attained the rank of Major in the R.A.M.C. Special Reserve on 18th June, 1914, and had since been promoted to Lieutenant-Colonel.

Captain Arthur Edward Kelsey, R.A.M.C., was educated at Gny's Hospital and at Cambridge, where he graduated as M.B. and B.C. in 1889. Entering the Navy soon after, he attained the rank of Fleet Surgeon on 11th November, 1907, and had retired before the war, and settled at Reigate. He took a temporary commission as Captain in the R.A.M.C. in July, 1917.

Captain Gerald William Young, R.A.M.C., was educated at Edinburgh, where he graduated as M.B. and Ch.B. in 1903, and as M.D. in 1907. He was stationed at Autofagasta, in Chili, as Chief Medical Officer of the Autofagasta and Belina Railway Company, till he came Home to join the R.A.M.C.

Captain Lewis Moysey, R.A.M.C., was educated at St. George's Hospital, and at Cambridge, where he graduated as B.A., M.B., and B.C. in 1895, afterwards studying in Vienna. After acting as House Surgeon to the Paddington Green Children's Hospital, he went into practice at Radford, Nottingham. He joined the Notts and Derby Mounted Brigade Field Ambulance as Lieutenant on 22nd October, 1914, and was promoted to Captain after a year's service.

Lieutenant John Addison Stainsby, R.A.M.C., was educated at the London Hospital, and took the M.R.C.S., the L.R.C.P., London, and the L.S.A., in 1894, after which he went into practice at Ecclesfield, Sheffield. He took a temporary commission in the R.A.M.C., in September, 1917.

Matron Kate Beaufoy was the daughter of the late Thomas Beaufoy, of Birmingham Post Office. She had served as a nurse in the South African War; and had served as Matron at different hospital ships since the beginning of the present war, and had received an Italian decoration.

## MENTIONED IN DISPATCHES.

THE following medical officers are among those mentioned by Major-General A. R. Hoskins, late Commanding-in-Chief, East Africa Force, in a dispatch dated May 30th, 1917:

Royal Navy: Surgeon (acting Staff Surgeon) C. G. Sprague, R.N.

Staff: Major R. T. Brown, D.S.O., R.A.M.C.  
Medical Services: Lieutenant-Colonel S. E. Prall, I.M.S.; Majors (temporary Lieutenant-Colonel) A. MacMunn, R.A.M.C.; C. G. Seymour, I.M.S. Majors: A. Cameron, C. E. Southon, G. G. Hirst, and W. S. McGilivray, I.M.S.; H. B. Owen and J. H. Reford, Uganda Medical Service; D. M. Tomory and P. St. J. Wilkinson, S.A.M.C.; Temporary

Majors: R. T. Meadows, D.S.O., R.A.M.C.; W. Owen Pritchard, E.A.M.S.; A. D. J. D. Williams, E.A.M.S.; Captains (acting Majors): J. Evans, S.A.M.C.; W. A. MacLennan, R.A.M.C. (S.R.); Captains: R. S. Armour, G. B. Fleming, J. D. Kidd, W. Mitchell, and B. Varvill, R.A.M.C.; J. J. D. LaZouche, R.A.M.C. (S.R.); G. T. Burke, M. L. G. Irving, W. M. Lupton, and M. J. Roche, I.M.S.; E. G. Smith, S.A.M.C.; Temporary Captains: I. B. V. L. Dalo and C. J. Wilson, E.A.M.S.; A. J. R. O'Brien and T. R. Sandoman, W.A.M.S.; A. M. Webber, R.A.M.C.; Lieutenant G. Covell, I.M.S.

Two appointments of Colonel, I.M.S., have been raised to two Surgeon-Generalships, I.M.S., and reserved for the military side of the Service.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, I.M.S., with effect from the dates specified:—

Minocher Cowasji Lungrana, 13th February, 1918; Kunjuni Thirupad, 25th February, 1918; Gopal Gangadhar Limaye, 26th February, 1918; Mangalore Nursing Rao, 28th February, 1918; Cochandy Oommen, 5th March, 1918; Padupurackal Thomas Zacharia, 5th March, 1918; Sitaram Visvanathan, 5th March, 1918; Naranammalpuram Sankara-aiyar Ramaswami, 7th March, 1918.

THE undermentioned 2nd class Sub-Assistant Surgeons having completed five years' service in that class to be 1st class Sub-Assistant Surgeons, with effect from the dates noted against their names:—

John David Baily, 6th January, 1918; Shaitkh Usmanmia Husainmia, 3rd February, 1918; Sadashiv Narayan Kharkar, 16th March, 1918.

#### Madras Establishment.

2nd class Senior Sub-Assistant Surgeon ranking as Jemadar, Saiyid Sulaiman, to be Senior Sub-Assistant Surgeon, 1st class, ranking as Subadar.

1st class Sub-Assistant Surgeon N. Vijayaraghava Mudali, to be Senior Sub-Assistant Surgeon, 2nd class, ranking as Jemadar.

vice 1st class Senior Sub-Assistant Surgeon ranking as Subadar, J. Williamson, invalided, with effect from the 1st March, 1918.

1st class Sub-Assistant Surgeon M. A. Thomas Pillai (supernumerary 2nd class Senior Sub-Assistant Surgeon, ranking as Jemadar), is absorbed in the grade of Senior Sub-Assistant Surgeon, 2nd class, ranking as Jemadar.

vice 2nd class Senior Sub-Assistant Surgeon, ranking as Jemadar, J. E. D'Cruz invalided, with effect from the 1st February, 1918.

THE meritorious service medal for devotion to duty in the field has been awarded to Lee, Hydr. Bansu and Naik Sargoo of the Army Bearer Corps.

LIEUTENANT-COLONEL S. P. JAMES, I.M.S., has retired from the service on account of ill health. Lieutenant-Colonel James entered the service on 26th July, 1896, and has done good work for many years on malaria, mosquitoes and yellow fever. He has been recently working in Mesopotamia.

LIEUTENANT-COLONEL J. K. CLOSE, I.M.S., Civil Surgeon, Allahabad, is granted privilege leave combined with furlough for a total period of three months, with effect from the 25th April, 1918.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified:—

Balbir Singh, 22nd August, 1917; Mervanji Dinshah Printer, 25th February, 1918; Nallicherry Somasundara Nataraja Sastri, 1st March, 1918; Kisory Mohan Ghose, 11th March, 1918; and Kiyattle Kannan Nambiyar, 20th March, 1918.

LIEUTENANT-COLONEL E. HASELL WRIGHT, I.M.S., Civil Surgeon of Coorg, is granted privilege leave for twenty-three days, with effect from the 10th November, 1917, and combined leave for one month, with effect from the 12th December, 1917, viz., privilege leave for twenty-eight days and the rest leave on urgent private affairs.

COLONEL C. R. M. GREEN, M.D., F.R.C.S., I.M.S., Inspector-General of Civil Hospitals, is appointed to hold, as a temporary measure, the appointment of Sanitary Commissioner, Central Provinces, in addition to his own duties.

MAJOR H. ROSE, M.B., F.R.C.S.I., I.M.S., Additional Assistant Director-General, Indian Medical Service, is appointed to be Assistant Director-General, Indian Medical Service (Stores), with effect from the date on which he assumes charge of the latter office.

IN modification of the Education Department Notification No. 549, dated the 17th December, 1917, Major F. Norman White, C.I.E., M.D., I.M.S., is appointed to be Sanitary Commissioner with the Government of India *sub. pro tem.* with effect from the date on which he relinquishes charge of his office as Assistant Director-General, Indian Medical Service (Sanitary), and until further orders.

MAJOR R. A. NEEDHAM, D.S.O., I.M.S., Assistant Director-General, Indian Medical Service (Stores), is appointed to be Assistant Director-General, Indian Medical Service (Sanitary), with effect from the date on which he assumes charge of the latter office.

THE rank of Surgeon-General W. H. B. Robinson, C.B., I.M.S., is dated from 8th January, 1918, and his tenure of appointment as Surgeon-General with the Government of Bengal will date from 12th March 1918.

THE following promotions are made, subject to His Majesty's approval, with effect from the dates specified:—

#### Lieutenants to be Captains.

John Barré de Winton Melony, M.B., F.R.C.S., 1st December, 1915.

Harold George Alexander, F.R.C.S.; Owen Wilson, M.B.; John Joseph Liston, M.B.; Kanshi Ram Batra, Bawa Harkishan Singh, Pindi Dass Chopra, M.B.; and Oscar Ramsey Unger, 16th July, 1916.

Ian Dingwall Grant, M.B.; Mahomed Moosa Khan, Satyendra Nath Mukerji, Herbert Edward Murray, M.B.; Ambuj Nath Bose, John Dow, Augustine Sargood Fry, John Gerald James Green, William Peat Hogg, Robert Lancolot Vance, and James Herbert Grovo White, 17th July, 1916.

IN exercise of the powers conferred by section 6, subsection (1), clause (c), and section 10 of the Indian Universities Act, 1904 (VIII of 1904), His Excellency the Chancellor of the Calcutta University is pleased to nominate the following gentleman to be an Ordinary Fellow of the Calcutta University:—

Surgeon-General W. H. B. Robinson, C.B., I.M.S.

HIS EXCELLENCY THE VICEROY AND GOVERNOR-GENERAL is pleased to make the following appointment on His Excellency's Personal Staff, with effect from the date specified:—

#### To be Honorary Surgeon.

Brevet-Colonel R. Heard, M.D., I.M.S., dated 1st April, 1918, vice Lieutenant-Colonel R. Bird, C.I.E., I.M.S., deceased.

THE promotion of the following Captains is antedated to the 1st September, 1915:—

Richard Reginald Maitland Porter, M.B.; Robert Sweet, D.S.O., M.B.; Edward Calvert, M.B.; John Robert Douglas Webb, Francis Phelan, Archibald Campbell Macrae, M.B.; Nawin Chand Kapur, Arthur Hilary Clifton Hill, Joseph Francis Holmes, Narayan Krishna Bal, M.C.; Haji Sulaiman Gulam-Hosseini Haji, Sahab Singh Bokhoy, M.B.; Atul Krishna Sinha, M.B. (since deceased); Subramania Doraisamy, Allan Seddon, M.B.; James Findlay, M.B.; William Collis Spackman, M.B.; Jyotish Chandra De, M.B.; Manulal Maganlal Mehta, Robert Morrison Easton, M.B.; Charles Henry Powell Allen, Reginald Victor Martin, George Henry Mahony, M.B.; Gordon Covell, M.B.; William Ross Stewart, M.B.; Kolyenkata Rama Rao, John Gregory Owen Moses, M.B.; Hari Chand, M.C.; Venkatasubba Mahadevan, Alured Charles Lowther O'Shee Bilderbeek, M.B.; Jacob William Van Reenen, M.B.; Basil Fraser Beatson, Maurice James Roche, M.B.; Neehal Dass Puri, M.B.; Prabodh Chandra Roy, M.B.; Monindranath Das, Jagannath Balkrishna Vaidya, Joseph Martin Reeves Hennessy, Alfred Glen Cowper, William Mawhood Lupton, Hubert Horan Brown, Charles Henry Neil Baker, M.C.; John Walter Pigeon, Maurice Lawrence Treston, Peter Vieira, M.B.; Bhamini Mohan Mitra, Philip Savage, Amir Chand, M.B.; Robert Lee, M.B.; Nilkanth Shriram Jatar, Tadepally Sankara Sastry, D.S.O., M.B.; Jamal-ud-din, M.B.; Ferozeshah Bapuji Chenoy, Sadanala Bashiam Venugopal, Charles deCarteret Martin, M.B.; and Joseph Henry Smith, M.B.

Their dates of First Commission are shown in Army List of January as 23rd January, 1913, 26th July, 1913, 31st January, 1914, and 1st August, 1914, so that in some cases the rapidity of the promotion is remarkable.

#### SUB-ASSISTANT SURGEON BRANCH.

##### Bombay Establishment.

SENIOR Sub-Assistant Surgeon, 2nd class, ranking as Jemadar Subjanji Ellappa Bhorgay to be Senior Sub-Assistant Surgeon, 1st class, ranking as Subadar, and

No. 227, 1st class Sub-Assistant Surgeon Mirza Muhammed Beg, *Khau Bahadur* (supernumerary Senior Sub-Assistant Surgeon, 1st class, ranking as Subadar), is absorbed in the grade of Senior Sub-Assistant Surgeon, 2nd class, ranking as Jemadar; *vice* 1st class Senior Sub-Assistant Surgeon, ranking as Sabadar Murtaza Khan, dismissed from the service, with effect from the 17th September, 1917.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, I.S.M., with effect from the dates specified:—

Dhan Raj Bhasin, 14th September, 1917; Nanak Chand Mohan, 6th October, 1917; Kaikhushru Ardeshir Jemsetji Lalkaka, 30th October, 1917; Keralapuram Sreenivasa Subramanyam, 29th December, 1917; Harry Herbert Colwell, 11th February, 1918; Jagadispada Dutta, 8th March, 1918; Madhusudan Babaji Mandhale, 17th March, 1918; Ramapurath Thimman Thomas, 20th March, 1918; Shankar Ganesh Chavan, 20th March, 1918; Joseph Peedikail Joseph, 21st March, 1918.

#### *Bombay Establishment.*

The Governor-General in Council is pleased to sanction, under the provisions of paragraph 470, Army Regulations, India, Volume II, the special promotions, with effect from the 31st March, 1918, of the undermentioned Warrant Officers of the Indian Subordinate Medical Department, for services during the war:—

Arthur Louis Gomes, to be 2nd class Assistant Surgeon.

#### *Madras Establishment.*

John Walker Gibbs, to be 2nd class Assistant Surgeon.

#### SUB-ASSISTANT SURGEON BRANCH.

##### *Madras Establishment.*

The Governor-General in Council is pleased to sanction, under the provisions of paragraph 470, Army Regulations, India, Volume II, the special promotion, with effect from the 31st March, 1918, of the undermentioned Sub-Assistant Surgeon of the Indian Subordinate Medical Department, for services during the war:—

1st class Sub-Assistant Surgeon A. J. Schaffter to be Senior Sub-Assistant Surgeon, 2nd class, ranking as Jemadar.

##### *Bengal Establishment.*

The Governor-General in Council is pleased to sanction, under the provisions of paragraph 470, Army Regulations, India, Volume II, the special promotions, with effect from the 2nd April, 1918, of the undermentioned Sub-Assistant Surgeons of the Indian Subordinate Medical Department, for services during the war:—

1st class Sub-Assistant Surgeons Zorawar Singh, Madho Parshad, Ram Ditta Mal, Barkatullah to be Senior Sub-Assistant Surgeons, 2nd class, ranking as Jemadar.

IN exercise of the powers conferred by section 3 of the Indian Medical Degrees Act (Act VII of 1916), the Governor-General in Council is pleased to authorise the Principal of the Medical College, Calcutta, to grant to Miss D. M. Ellis and Miss G. Griffiths, two students who passed out of the Female Certificate class of that College, subsequent to the enactment of the said Act, certificates entitling them to practise medicine, surgery and midwifery.

LIEUTENANT-COLONEL A. HOOTON, I.M.S., has been granted privilege leave of absence for two months, with effect from the 1st April, 1918, or from the subsequent date of relief.

HIS EXCELLENCY THE GOVERNOR OF BOMBAY in Council is pleased to appoint Major A. F. Hamilton, I.M.S., to act as Surgeon, Gokuldas Tejpal Hospital, Bombay, in addition to his military duties, during the absence on leave of Lieutenant-Colonel A. Hooton, I.M.S.

SURGEON-GENERAL THOMAS GRAINGER, C.B., M.D., has been permitted by the Right Hon'ble the Secretary of State for India to retire from the service, subject to His Majesty's approval, with effect from the 29th April, 1918.

SUBJECT to His Majesty's approval, Lieutenant-Colonel John Lloyd Thomas Jones, M.B., Supernumerary, is permitted to retire from the service on account of ill-health, with effect from the 28th April, 1918.

SURGEON-GENERAL TOM. GRAINGER entered the I.M.S. on 1st October, 1885. He served in the Sikkim expedition of 1885 and took part in the action on the pass into Tibet, the Jeylap La, also in the Black Mountain Expedition of 1891, and in the Tirah Expedition of 1897-8, where his good work in getting his hospital through the terrible Bara Valley was awarded by substantive promotion to the rank of Lieutenant-Colonel (a step of nearly 8 years in seniority). Meantime

he had been a Civil Surgeon in Behar and Bengal. He became Surgeon-General and D. D. M. S. of Rawal Pindi in May, 1914, and went Home on medical certificate in April, 1917. He was awarded the C. B. in June, 1911, and was made an Honorary Physician to the King in 1915.

LIEUT.-COLONEL J. LLOYD JONES, I.M.S., entered the service in October, 1887, and was employed and did first class work in the early days of the plague epidemic at Poona. He then entered the Mint Department and served as Assay Master both in Calcutta and Bombay for many years past. He completed his full pension service in December last.

THE following promotions are made, subject to His Majesty's approval:—

#### *Captains to be Majors.*

Dated 1st March 1918.

Charles Richard O'Brien, M.B.; Norman Haliburton Hume, M.B.; and Duncan Macdonald Cochran Church, M.B.

THESE three officers entered the service on 1st February, 1906, and became Captains on 1st March, 1909, and now Majors nine years later; that is after 12 years and one month's service.

As an Indian "Sandhurst" has been for sometime working at Quetta, so now we are to have an Indian "Netley" started at Rawal Pindi for the training of temporary lieutenants joining the service. This is certainly a step in the right direction and one which was much needed.

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters, and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage abroad.

## BOOKS, REPORTS, &c., RECEIVED:—

- L. William's Minor Maladies, 4th Ed. Cr. 8vo. Baillière, Tindall & Cox.
- Beifeld's Bases of Symptoms, 2ls. net. J. B. Lippincott Company.
- White & Martin's Genito-Urinary Surgery. 10th Ed. Price 30s. J. B. Lippincott Company.
- C. Norman Paul's Sunlight and Cancer of Skin. Crown 4to. 10s. 6d. H. K. Lewis & Co.
- Emery's Tumours, their Nature, &c. H. K. Lewis & Co. 5s.
- N. P. L. Lumb's Systematic Treatment of Gonorrhoea. H. K. Lewis & Co. 4s. 6d.
- Willoughby & Cassidy's Antimalarial Work in Macedonia. H. K. Lewis & Co. 3s. 6d.
- L. Jones and Bathurst's Medical Electricity (7th Ed.). H. K. Lewis & Co. 15s.
- Quarterly Journal of Medicine, Vol. II. No. 42 (January 18). Clarendon Press, Oxford.
- Wenyon & O'Connor's Human Intestinal Protozoa. (Wellecome Bureau.)
- L. Brown's Rules for Recovery from Tuberculosis. Philadelphia; Lea and Febiger.
- R. C. Mace's The Romance of the Human Body. 6s. net. Wells, Gardner, Darton & Co.
- F. Taylor's Practice of Medicine. 11th Ed. 24s. J. & A. Churchill & Co.

## LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

Lt.-Col. Clayton-Lane, I.M.S., Hooghly; Lt. R. Ardeshir, I.M.S., Dacca; Major D. McCay, I.M.S., Calcutta; Sir L. Rogers, I.M.S., Calcutta; Lt.-Col. Hassall Wright, I.M.S.; Dr. Macphail, Monghyr; Major R. Austin, R.A.M.C., Calcutta; Lt.-Col. R. Bryson, I.M.S., Madras; Lt.-Col. K. Prasad, I.M.S., Burma; Dr. S. H. Pugh, Trichinopoly.



## Original Articles.

### PLAGUE AND RAT DESTRUCTION.

By F. NORMAN WHITE, C.I.E., M.D.,

MAJOR, I.M.S.,

*Sanitary Commissioner with the Government of India.*

To the January and May numbers of the *Indian Medical Gazette*, Colonel G. W. P. Dennys, C.I.E., I.M.S., contributed two lengthy articles, with the object of demonstrating that money spent on rat destruction is money wasted and that rat destruction is worse than useless as an anti-plague measure. He arrives at the conclusion that attempts at rat destruction have in certain towns tended to increase the chance of such towns becoming plague infected. Such conclusions are startling and at variance with the well-found opinions of many, but it was not my intention to make any attempt at a rejoinder until news reached me that the prosecution of anti-plague measures in various parts of India is being seriously hampered by the amount of attention that has been paid to the two articles referred to above.

Colonel Dennys concludes his first article with the generous statement that he is quite open to conviction, and is ready to withdraw what he has said, if it can be shown that he is wrong; but that it is for those who are of contrary opinion to demonstrate that his reasoning and conclusions are fallacious. I shall accordingly endeavour in this short paper to indicate in what respects some of Colonel Dennys's statements and assertions are at variance with the results of carefully conducted research and scientific observation.

I think it will be profitable, in the first place, to consider the premises on which Colonel Dennys's somewhat elaborate deductions are based. On page 2 of the first article he reproduces a note that he wrote in August, 1915, presumably for the information of his Local Government, and I gather that that note still represents his *confessio fidei*. On the "beliefs" therein set down most of his deductions are based. That note disregards in a somewhat surprising manner practically all the results that carefully conducted research has obtained with regard to the matters dealt with.

We are told that plague outbreaks, both as regards frequency and virulence, are quite independent of the size of the rat population: that plague outbreaks only occur when fleas exist, and that these insects only exist at certain seasons: that in places like Bombay, where the disease is more or less endemic, it is probable that fleas exist at all seasons of the year: that the subsidence of a plague outbreak coincides with the conclusion

of the flea season and not with a reduction in the number of rats: that there are always enough rats left after a plague outbreak to keep the disease going in man, if fleas continue to thrive on the bodies of the rats, but unlimited infected rats are harmless if they have no fleas: that fleas' eggs laid in one spring do not ordinarily hatch till the following spring: that rats suffering from chronic plague act as foci for a fresh epidemic. Later we are told that where chronic flea-infestation is found plague becomes endemic, where seasonal infestation occurs there epidemic plague occurs. About Nagpur we learn that when fleas are absent the thousands of *pestis*-carrying rats are powerless for harm: that if the rat population is below the normal, those that do exist will be more flea-infested than if the area concerned had a normal rat population. We are told that fleas lay their eggs in cracks, corners and crevices and then die: that there is little difference between the dog-flea and the rat-flea except in their choice of food. It is inferred that the death of rats from plague increases the flea-infestation of the remaining rats. Though it is not specifically stated, I think we may assume that when Colonel Dennys refers to the flea it is the common Indian rat-flea, *Xenopsylla cheopis*, that is indicated. Finally, the conclusion is reached that attempts to destroy rats are useless and probably harmful, and may tend to increase the number of plague cases in man.

I think the above represents a fair sample of the data on which Colonel Dennys bases his arguments: *every single one of these statements is incorrect in the context in which it is placed and the vast majority of them are absolutely and fundamentally wrong.*

All these matters, about which Colonel Dennys dogmatizes and theorizes, were made the subject of most exhaustive research by the Plague Research Commission, which started work in India in 1905, and the eleven voluminous reports that have been published as supplements to the *Journal of Hygiene* since that date, give full data of all the experimental work done. These reports were widely circulated and are available to all interested. Colonel Dennys sees fit to ignore all the conclusions arrived at: why, we are not told. If he had made a careful study of them, his contributions to the literature of plague could, I think, never have been made in the form in which they have appeared in the pages of the *Indian Medical Gazette*.

There is no season, in any part of India, where rat-fleas (*X. cheopis*)\* are "conspicuous by their

\* In the North of India *Ceratophyllus fasciatus* is occasionally found on rats in addition to *X. cheopis*, but its numbers are so insignificant in comparison with *X. cheopis* that the latter need only be considered in the present connection. Adult *C. fasciatus* have only been found in India in the cold weather months and not further south than Cawnpore.



absence." Ballia, Cawnpore, Lucknow, Belgaum and Poona may be taken as examples of places in India that suffer from well-marked epidemics of plague. In no month of the year in Ballia is the average number of fleas per rat less than 4·8: in Lucknow less than 2·4: in Cawnpore less than 3·2: in Belgaum less than 3·8: in Poona less than 2·2. In Madras, where climatic and other conditions appear to be relatively unfavourable to the rat-flea, the average number of fleas per rat in no month fell below 2·2: similar conditions prevail in Bombay. In view of these facts and numerous other carefully recorded observations, a sentence such as this, "where chronic flea-infestation is found plague becomes endemic, where seasonal infestation occurs there epidemic plague occurs," makes strange reading.

When dealing with the bionomics of the rat-flea, Colonel Dennys assumes that "there is little difference between the dog-flea and the rat-flea," and makes some astonishing statements. Fleas' eggs laid in one spring hatch in the following spring. Had not this statement been repeated one would have imagined it to be a slip. One could have believed tales of abnormally prolonged life in the cocoon stage, in which stage the insect is most independent of external conditions. As the result of observations made in England, it was found that the cocoon period of *X. cheopis* at temperatures below 65°F. was sometimes prolonged. The duration of the cocoon stage in these English laboratory experiments varied between 7 and 182 days, but the prolonged periods were only experienced at temperatures far and away below anything experienced in plague-infected India. In the Bombay Presidency and in the Punjab *X. cheopis* lays eggs at all seasons of the year. These eggs hatch out in a few days; in Bombay in about two days. The breeding places of *X. cheopis* are almost exclusively in or about the nests of the rat, and rats' faeces appear to be an important article in the normal diet of the flea larva. All the stages in the life-history of *X. cheopis* are undergone in close proximity to the rat, on which animal the parasite is more dependent, than are many of the other species of fleas on the animals which they parasitize.

Colonel Dennys complains that the hackneyed phrase "No rats—no plague" is but a platitude, and would have it replaced by "No rat-fleas—no plague." If a study of the considerable amount of literature on the bionomics of the rat-flea be made one will learn that "No rats—no rat-fleas" is a statement of fact that well-informed writers have refrained from putting in that form presumably because it is usually unnecessary to labour the obvious. All who have given any time to the study of *X. cheopis* will appreciate the fact that the only practical way of dealing effectively with that parasite is by attacks on the rat, its

definitive host, a proceeding that Colonel Dennys stigmatizes as useless and dangerous!

In all parts of India that have been investigated there is a well-defined seasonal prevalence of the rat-flea though, as I have said, to speak of a rat-flea free season in any part of India is inexcusable exaggeration. Colonel Dennys says that "we have not been able to discover the factor that tends to make the flea so much more prevalent in certain years and seasons than in others." I am not quite clear what the author intends to convey. If it be that there is no *single* factor, perhaps he is right; but it seems more probable that he is either ignorant of all the work that has been done with regard to, let us say, the influence of atmospheric humidity on flea prevalence, and on all the stages of the flea-breeding process or, else, for reasons he does not state, he disagrees with all the published conclusions arrived at. In this matter also, the extent to which he ignores all the scientific work that has been done on the subjects about which he writes makes it extremely difficult to frame a conclusive reply to his arguments.

The explanation that Colonel Dennys gives as to the origin of fresh outbreaks of plague being associated with "chronic pestis-carrying rats" is contrary to all experience, and somewhat original. The Plague Commission showed many years ago that the so-called chronic or resolving plague in rats is only a stage towards recovery, and they adduced conclusive evidence to show that such rats are of no importance at all in carrying over infection from one season to the next.

Colonel Dennys has a good deal to say about the seasonal prevalence of plague and its relationship to rat and rat-flea prevalence, but why one should theorize, when one has facts to go on, is not clear. No question in the whole epidemiology of plague has received more careful scientific attention than has the relationship between the annual flea curve and epidemics of plague; it has been worked out in numerous places in the Bombay and Madras Presidencies, in the Punjab and in the United Provinces; why ignore all the mass of published results? For obvious reasons one cannot summarize here all the results obtained. Perhaps it will be useful to state four:—

(1) That the onset of an epidemic, if infection be present, follows and is determined by a rise in the number of rat-fleas.

(2) That there is not the least evidence that rat destruction or the death of numerous rats appreciably increases the flea-infestation of the surviving rats. This is of course readily understandable in the case of "trapping": the fleas adhere to the captured rats. It is more difficult to explain in other cases, but the fact remains that we were never able to determine a greater degree of flea-infestation in plague-infected

parts of a town than in plague-free areas. Moreover, the "flea curve" has frequently been observed to reach its height before the advent of plague, and the subsequent epizootic has not resulted in a greater degree of flea-infestation of the rats.

(3) That as definite a seasonal prevalence of fleas exists in certain places in India that have never suffered from epidemic plague as in plague-infected places. As a matter of fact there was a greater flea-infestation of rats observed in Banda, in the Bundelkhand, that has never suffered from epidemic plague, than in any other place that has been investigated in like manner.

(4) That epidemics have been observed to come to an end when fleas were as numerous as fifteen per rat, *because rats have been reduced in number to a level that made further spread of the disease impossible.* When rats are numerous, four or five fleas per rat are sufficient to spread the disease.

I do not wish it to be understood that a diminishing flea-infestation is never a factor of importance in bringing an epidemic to a close. At times it is the most important of all factors.

All these statements are based on published observations made on thousands of rats and hundreds of thousands of fleas which were carried on over a period of several years. Such observations are all ignored by Colonel Dennys, and yet not a single fact is deduced to support his original ideas about the epidemiology of plague, if we except an account, written from memory, of an experiment on the fecundity of the tame white rat carried out by him some years ago. The fecundity of the Indian wild *Mus rattus* was made the subject of experiment, and the results have been published in the reports of the Plague Research Commission: these experiments are also ignored.

From the epidemiological point of view surely it is obvious that plague infection will be spread more rapidly and more widely where rats are numerous than where they are few: that rat destruction results in increasing as it were the intervals between adjacent rats, and that if these intervals can be sufficiently enlarged infection will die out altogether.

There is one other fact that is commonly overlooked by the advocates of "disinfection" of plague-infected houses and other measures directed against the rat-flea, whilst the rat is ignored: I refer to the fact that the vast majority of plague cases are single cases, that is to say that one case per house is the rule. If more than one case occur in a house it is the rule for all the cases to acquire the infection at or about the same time. This indicates that a house remains infective for a very short space of time; and that rat-fleas deprived of their rodent

hosts are, in natural conditions, either very short-lived or remain infective for very short periods.

It might well be asked how does all the above more or less inconsequential matter bear on the practical value of rat destruction as a plague measure. I have been driven to refer to these questions because Colonel Dennys uses them in the chain of argument which leads him to the dangerous conclusion that attempts to reduce the rat population of a town have tended to increase the chance of that town becoming plague infected. I have said that all these 'facts' and 'theories,' almost without exception, are fundamentally unsound. Need we further seriously consider conclusions based on such unsound foundations?

In his second contribution Colonel Dennys gives certain facts about 43 places in the Central Provinces with the idea of showing that practical experience has shown rat destruction to be useless and harmful. The information given is not nearly sufficient to enable the reader to draw any such conclusions. One notices in the first place that the number of rats destroyed, when stated, is almost invariably small, which makes one doubt the efficacy of some of the measures employed.

I, in common with Colonel Dennys, have seen futile rat campaigns and money wasted. I have seen traps used into which entry was difficult and from which escape was absurdly easy: I have seen poisons which rats would not eat, used in vast quantities: I have seen the collection of rats in towns as the result of a monetary reward offered for rats, and I have frequently been interested in the appreciable percentage of the relatively harmless field rat in such collections. I have generally seen the operations in charge of people quite ignorant of the habits of rats and of the epidemiology of plague. I have, in fact, rarely seen a well-organized rat campaign carried out with due regard to the habits of rats and the epidemiology of plague.

I admit that indiscriminate rat destruction, as it is too often carried out, effects very little good, but I sincerely believe that rat destruction will always remain a most valuable anti-plague measure. Surely the only logical conclusion that can be drawn from the failures such as those enumerated by Colonel Dennys is that the methods of indiscriminate rat destruction employed were ineffective; not that rat destruction in itself is a harmful measure.

Were I in charge of the plague measures of a given town, I should begin by making a careful study of past epidemics of the disease in my area. In very many cases it is found that plague almost invariably makes its appearance in one well-defined section of a town, commonly in the vicinity of grain stores or markets. If this were so, I should concentrate my efforts with trap

and poison on this locality in the non-epidemic season (a time of the year when most think it meet to rest from their anti-plague labours, but, in reality, a time when the most useful effort can be made) and continue to keep the relatively small area relatively rat-free. I should agitate until I got the buildings in this area built so as to make this an increasingly easy matter. I should pay similar attention to all grain stores and markets where rat-infestation is usually so large. By efficient scavenging and other measures of a general nature I should endeavour to curtail the available food-supply for rats. Were infection reported in any part of my area in the non-epidemic season, I should use every means in my power to eradicate that focus of infection before conditions again became favourable for the spread of the disease: in such circumstances rat destruction offers us the only chance we have of *eradicating* plague infection. To start rat destruction measures only after an epizootic has started, and to give them up directly the epidemic begins to decline, is to run the risk of adding to the number of those who think with Colonel Dennys.

If plague infection broke through my barrier I should devote most unremitting attention to the first few indigenous cases and attempt to destroy all rats in an area of, say, a hundred yards radius, all round the infected dwelling, working from without inwards. These rats would be examined for signs of plague infection—a simple matter—and the results of such examination would determine further measures. I should never allow evacuation of dwellings in an infected area of a town until arrangements had been made to house the refugees, and that every endeavour would be made to destroy the rat population of such evacuated dwellings; otherwise the rats, with their food-supply cut off, would be likely to go elsewhere for food and so spread the infection. I have seen harm done in this way quite recently. Never should I cease to preach that the rat is a dangerous and expensive occupant of a house: I certainly would not encourage its presence, as would Colonel Dennys.

In another part of this issue of the *Indian Medical Gazette*, below, is published a memorandum on plague preventive measures which has been circulated widely. Some of the suggestions made therein may be of assistance to the practical plague worker. In the preparation of the sections dealing with the habits of the rat and rat poisons I have drawn largely on the results of experiments started in Poona by Major J. C. G. Kunhardt, I.M.S., and carried on by Dr. Chitre on behalf of the Indian Research Fund Association. A full report of these experiments will shortly appear in the *Indian Journal of Medical Research*. Present attempts to increase the efficacy of our rat-destruction methods are yielding promising results.

I frankly acknowledge that the complete *eradication* of the rat by means of rat destruction is impossible in any Indian town, but that does not mean that rat destruction energetically carried out in the non-epidemic season cannot diminish or eradicate altogether foci of plague infection; in most parts of India such foci are not numerous in favourable years: *it does not mean that rat destruction cannot diminish the risks of plague and diminish mortality. It can do both.*

The waste of life consequent upon the recent severe plague epidemic gave promise, in certain parts of India, of real attempts to deal with the situation. There were signs that a few people were beginning to believe the simple truths that plague is merely a return for kindness and hospitality offered to the rat population, and that the more numerous the rats in town, village or dwelling, the greater the chance of the inmates of such places dying from plague. Colonel Dennys's two articles have, I hear, very effectually discouraged such notions at the very time when concentration of effort is essential, the non-epidemic season. This is much to be regretted, and I trust the little I have written may suffice to undo some of the harm which appears to have been done.

#### MEMORANDUM ON PLAGUE PREVENTIVE MEASURES.

PLAGUE, as we know it in India, is a disease of rats, in which man and a few of the lower animals participate. The disease is caused by the invasion of the body by the plague bacillus. The plague bacillus is spread from rat to rat, and from rat to man, and to certain other of the lower animals, by the bite of the rat-flea. The fact that man is susceptible to the disease is the reason, of course, that the disease is of such importance to the public health of India, but it must be remembered that from the point of view of the plague bacillus, if such an expression be permitted, man is relatively of small account. An epidemic of plague among men is but an index of the epizootic that is raging among the rat population of the community. Were there no rats, or were rats less "domesticated," or were the habits and customs of people in this country such that rats found it difficult to obtain food and shelter in human habitation, plague, as a human disease, would disappear from India. The fact that the association between rats and man is so close in this country is the sole reason why plague is so serious a factor in our vital statistics.

If the significance of these simple facts be grasped, measures for the eradication of plague as a human disease suggest themselves. Every effort should be made to induce the people of this country to realize that the apathy with which they gladly suffer the rat to share their food, and find shelter in their homes, is directly responsible for the fact that they suffer and die from this disease. Once this lesson has been driven home plague as a human disease will cease to afflict the converted community.

In the meantime, it is necessary to consider what measures can be undertaken most profitably to save the people in spite of themselves, realizing that the degree of success obtainable must depend in some measure on the amount of co-operation secured.

One of the most remarkable facts about outbreaks of plague in India is the remarkably constant seasonal prevalence that the disease exhibits in any given part of the country. For example, plague epidemics always reach their height in the Punjab and the west of the United Provinces in the month of April; in the east of the United Provinces, and in Bihar in the month of March; in the south of the Bombay Deccan about October; in Bombay City, about March. This phenomenon is explained by the fact that the rat plague, on which the human epidemic depends, is most acute at that season of the year when rat-fleas are most numerous. The number of rat-fleas is dependent upon conditions of atmospheric humidity and temperature. This dependence upon climatic condition explains, not only why plague has a constant seasonal prevalence in any given area, but also why the disease is much more virulent and widespread in some years than in others. Thus severe epidemics in the north of India have always been preceded by abnormally damp weather in the cold weather months.

In places where rats are very numerous plague may develop when climatic conditions are adverse, i.e., when rat-fleas are scarce, but plague tends to disappear with the advent of hot, dry weather.

It cannot be too strongly emphasized that anti-rat measures, directed towards the eradication of plague infection, can be prosecuted with most chance of success in the hot, dry months when plague cases and foci of infection are fewest. The relatively plague-free season should synchronize with maximum anti-plague effort and not be regarded as a suitable time for a cessation of anti-plague measures.

Anti-plague measures can be grouped under four heads:—

(a) Rat elimination or the prevention of rat infestation. This comprises such modifications in the habits, customs, and dwellings of a community as will result in a diminished rat infestation in the homes of the people and make the association between rats and men less intimate than at present.

(b) Measures designed to protect the rat population of any given town or village from plague infection. These entail a clear understanding of the manner in which plague infection is carried from place to place.

(c) Rat destruction designed, as is (a), to diminish the chances of infection, and to keep the rat population at so low a level that if plague be introduced the severity of the resulting epidemic will be appreciably diminished.

(d) If our efforts under these three heads fail to keep plague out, it is left to try and render the human population immune to attacks of the disease by means of inoculation, or to remove the population at risk from close association with infected rats. The latter involves the evacuation of infected dwellings and the provision of temporary accommodation outside the rat-infested, plague-infected area.

Measures included under (a), (b), and (c) can be carried out at any season of the year; measures under (d) are generally applicable only in the plague season.

Segregation of the sick is not essential. For all practical purposes the patient suffering from *bubonic plague* is not capable of infecting those in close attendance on him. Such a statement is not true of *pneumonic plague*. Small outbreaks of this disease, which is extremely infectious, are occasionally experienced in India. These are, however, of infrequent occurrence and of small moment when compared with the incidence of *bubonic plague*.

It will be noted that of the four "components" of a plague epidemic, viz. the plague bacillus, the rat-flea, the rat, and man, only the rat and man have been specifically mentioned in this preliminary discussion of preventive measures. The plague bacillus is so short-lived outside

the body of either the rat-flea, the rat, or man, that for practical purposes it need not be considered as possessing an independent existence. Similarly, the welfare of the rat-flea is so dependent on the plentiful supply of rats which they parasitize, and has so short a life apart from its proper host, especially if it be infected with plague, that "anti-flea" measures received no specific mention. Such measures will be referred to when (b) is under detailed consideration: they have very decided value and should in no wise be overlooked.

#### I.—RAT ELIMINATION.

A full knowledge of the habits and customs of the rat is essential to the successful prosecution of anti-plague measures.

1. *The Rat*.—The common Indian house rat, *Mus rattus*, is a very domesticated animal and is rarely found far from human habitation. For shelter it seeks the darkest corners of the dwelling, especially if such offer facilities for burrowing and a convenient supply of food. Such dark corners are to be found in almost any Indian dwelling. The rat possesses remarkable powers of climbing, and the ordinary *kutcha* mud wall offers no difficulties. A hard, smooth vertical surface free from irregularities and projections is not easily surmounted. A water-pipe or a drain-pipe which can be grasped by the rat's legs and tail is easily climbed. A ledge, projecting horizontally nine inches or more from the wall, if quite smooth and hard on the under surface, presents an insurmountable obstacle. A rat may succeed in jumping on to a ledge 2½ feet high but not one 3 feet high.

Grain is the natural food of *Mus rattus*, which is very largely vegetarian in its habit: in certain circumstances the house rat will devour 'meat,' or even the dead bodies of other rats, but uncooked grain is their chief article of diet. The variety of grain that is most attractive to rats differs in different parts of the country, but the rats of any given locality are remarkably conservative. Usually the rat favours that variety of grain which forms the staple food of the human population among which it dwells. Thus the rats of Poona prefer *bajri* to anything else; the rats of Madras are rice-eaters; the rats of Sholapur affect an equal preference for *jowari* and *bajri*. Very remarkable, too, is the facility with which the rat is able to identify dough made from the flour of the grain to which it is accustomed when several varieties are offered in exactly similar form. The addition of such substances as meat, fish, cheese, sugar, fats, condiments or salt, as a flavouring to dough made of flour and water, does not in any way render the mixture more palatable or attractive to the rat. This statement is at variance with commonly accepted notions and many will find it difficult to credit that a rat has no very great partiality for cheese, for example. Nevertheless the above statement is based on the results of numerous controlled observations designed to determine this special point. It is not contended that rats will not eat such substances as those enumerated above: at times they will eat almost anything; nevertheless they exhibit universally a preference for grain, or flour made from grain in the form of a paste, in preference to all else, and they like it best unflavoured. Finally, rats must have water if their food be dry; sufficient water is obtainable from fresh, or wet, vegetables or grass.

A rat becomes sexually mature at a little over two months; the most common number of young at a litter is five. The sexes closely approximate each other in number. So prolific are rats that given sufficient food and shelter, a pair of rats may become eighty pairs in the course of a year.

In most parts of India the majority of *Mus rattus* burrow: burrowing does not appear to be essential



provided shelter and freedom from molestation can be secured, a state of affairs that is everywhere found in Indian habitations.

Rats do not commonly migrate far from their homes.

These then are the more important of the characteristics of the Indian house rat, which plays so important a part in the spread of plague. Successful efforts at rat-elimination and rat-destruction necessitate a display of intelligence, energy, persistence and a lively understanding of their habits and customs as outlined above.

Before considering measures in detail it may be worth while to refer to the economic aspects of the case. An adult rat consumes upwards of  $\frac{3}{4}$  oz. of grain each day. Let us take the case of an Indian town with a human population of a quarter of a million people. Such a town at a very low estimate will have a rat population amounting to half a million. Let us suppose that the rats of this town have a preference for a grain selling at ten seers for the rupee. The rat population of this town would consume grain *each day* to the value of Rs. 1,170 and at the same time do a vast amount of damage to human property of other kinds. (This sum is equivalent to Re. 1-11-0 per head of population per annum, an amount which if devoted to public health would insure freedom from plague and many other diseases as well.) Truly the inhabitants of this country in so gladly suffering the rat suffer in other ways than those of disease and death.

2. *Rat-elimination.*—Energetic and sustained rat-destruction campaigns, carried out on lines such as those that will be described hereafter and with due attention to detail, will do much towards keeping the rat population at a low level with a consequent markedly diminished risk of plague-infection and the certainty of a much milder epidemic, should the disease gain a foothold, than would otherwise be the case. Such measures have the great disadvantage that they necessitate sustained effort, which is very difficult to secure in India, when a few years' freedom from plague so commonly engenders a false sense of security. If halfheartedly carried out, the results will be most disappointing and the number of those who claim that rat-destruction campaigns are useless, and consequently waste of funds, will be increased.

Moreover, rat-destruction campaigns are of only temporary benefit, and it is necessary first to consider whether the houses, habits, and customs of the people cannot be so modified as to render the association between the rat and human population less close than it is at present. As things are, there is no limit to the amount of food and shelter that the average Indian house affords to the rat. In this connexion it would be well to draw attention to the fact that the two terms 'rat-proof' and 'rat-free,' as applied to dwellings and store-houses, are by no means synonymous. Very little advantage is gained if the floors, walls and roof of buildings be so constructed as to make it impossible for rats to burrow therein, if such erections offer no lack of food and shelter to rats and if ingress and egress through doors and other apertures be not prevented by some special device. This word of warning is very necessary: in many parts of India one can see buildings that have been made 'rat-proof,' harbouring, all the same, a very large number of rats. Small wonder that such laudable endeavours to abolish plague have met with a degree of success in no way commensurate with comparative large outlays that some such schemes have involved.

These remarks must not be construed as meaning that *pucca* buildings are not preferable in every way to *kutchas*, but the provision of *pucca* walls and floors is not in itself sufficient to ensure freedom from rats.

Even in *kutchas* buildings something can be done towards eliminating the rat. The rat population of any place is directly determined by the amount of food and shelter that such place affords. All measures that lessen the amount of food and shelter for rats automatically effect a reduction in the number of rats. Protection of stores of food from the depredations of rats, and efficient scavenging, are thus anti-plague measures of the first importance.

## II.—PROTECTION OF THE RATS OF A COMMUNITY FROM PLAGUE.

Before embarking on a detailed description of active rat-destruction measures it will be well to consider how best to protect the rat population of any town from becoming infected with plague, or to make the over-present possibility of such an occurrence less likely. To this end it is important to bear in mind the methods by which plague infection is conveyed from place to place.

1. *Grain and plague.*—It is a common experience to find plague in towns and villages beginning in the close vicinity of markets and grain stores, and it is important to have a clear conception as to why this should be so. As things are at present the rat population of any given town or village is very much larger in the neighbourhood of markets and grain stores than in other localities, with the result that when plague is present the rat epizootic is likely to be more widespread in such localities than elsewhere. It follows that grain exported from a plague-infected town to another, goes from a part of the town of despatch where plague is most severe, to a part of the receiving town where the rat population is at a maximum. Not only so but grain and similar merchandise offer facilities for the transport of rats which baggage consisting of personal effects rarely affords. Plague-infected rats are likely to be much more harmful as plague-infecting agents than are fleas alone which, apart from their definitive hosts, are short-lived, especially if infective.

From these and other considerations it follows that the methods of grain storage and grain transport are of paramount importance in plague-infected and plague-threatened India, where the grain trade is in a very special sense a "dangerous trade," and as such demands very close supervision. There is a large mass of epidemiological evidence to show that the rate of diffusion of plague-infection is very slow when it has to rely on the movements of the human population *per se*, but that the movements of grain afford facilities for the dissemination of infection equalled by no other agency. Were the grain stores of India kept relatively rat-free a marked and rapid diminution of plague would most assuredly result. Is such a consummation as impossible of attainment, or as difficult, as is usually assumed?

A great deal can be done with no prohibitive outlay. In discussing this matter it is important to bear in mind certain facts regarding the habits of rats cited above. They explain the logical basis of the following *desiderata* of grain stores:—

(a) Wherever possible the wholesale storage of grain should be effected in buildings apart from those in which retail trade is carried on.

(b) Wholesale grain stores should not be situated in close proximity to densely-crowded areas of a city.

(c) Wholesale grain stores should never be utilized for purposes of human habitation.

(d) Bearing in mind that water is essential for the life of the rat, no water accessible to rats, or fresh vegetables, should be allowed in wholesale grain stores.

(e) As rats are unable to circumvent a smooth horizontal projection of nine inches, such a ledge surrounding a grain store on the top of a plinth three feet high is effective in prohibiting the ingress of rats. On the sides of the building in which the doors are situated



this ledge can conveniently be enlarged into a platform 2 feet or 2 feet 6 inches in width. Reinforced concrete is a suitable material for such ledges and platforms.

(f) The roof of the godown should overhang this platform and ledge to prevent the accumulation of rain-water thereon.

(g) No stops or similar means of facilitating ingress should be allowed. In practice the inconvenience caused by the absence of such steps will be found inconsiderable. For unloading sacks of grain designed for such a store the bullock-cart can be pushed close to the platform, which is also at a convenient height to facilitate the deposit thereon of sacks from a cooly's back.

(h) Rats will, from time to time, be introduced into such a store, but they will be compelled to leave in search of water and should find their return extremely difficult.

(i) In villages and places where the cost of such *pucca* buildings is prohibitive, relatively rat-free stores can be made of almost any material, provided the roof is water-tight, by raising the floor on uprights surmounted by rat-guards similar in design to those commonly employed on ships' cables. These uprights should be at least three feet high and would support the beams on which the floor rests. This floor might be made of wood. The space underneath the floor can be left open and kept free from weeds and rank growth with but little trouble.

The above suggestions should be sufficient to enable "rat-free" godowns, suitable for any requirements, to be designed. Provided the principles on which the suggestions are made be borne in mind, suggestions which are all based on an appreciation of the habits of rats, these godowns will be so constructed and kept as to ensure a remarkably decreased rat population.

Other means of diminishing the risk of the conveyance of plague-infection through the medium of grain and similar merchandize will suggest themselves. The diminution of the facilities, at present existing, for rats to enter goods-wagons and carts; the breaking of bulk of consignments of grain; the erection of *pucca* platforms on which grain received loose can be bagged; these and similar measures all require attention in certain cases. Enough has been said to draw attention to the importance of the grain trade in the spread of plague, and the above suggestions and principles should suffice to indicate how the dangers can be minimized, if not entirely averted.

2. *Other means of conveying plague infection.*—Grain and similar merchandize has been considered at length to emphasize their importance, but it is not contended that they afford the only means of conveying plague-infection. Clothing and bedding from plague-infected houses may contain infected rat-fleas: the chance, however, of such finding a susceptible rat as a host, without which they cannot give rise to an epidemic, is sufficiently remote to explain the fact that merchandize is a more potent source of plague infection.

When articles from a plague-infected source are of such a nature as to render them likely to harbour fleas, they can be rendered innocuous by exposure to the direct rays of the sun. The ground used for the purpose should be so chosen that the sun is able to shine on it for the whole of each day. It should be flat, devoid of grass, stones, or anything which might afford shelter to fleas. Preferably it should be covered with a smooth layer of fine sand three inches deep. The surface temperature of the sand should be at least 120°F. to ensure the destruction of all fleas. One hour's exposure in such conditions is sufficient for the purposes of disinfection. Thick coats and *razais* should be turned once or twice during the process. No articles should be placed within three feet of the edge of the sand.

### III.—RAT-DESTRUCTION.

Careful attention to detail and a knowledge of all that has been said above regarding the habits and customs of rats are essential to success in any rat-destruction campaign. Not infrequently rat-destruction as a plague measure has been stigmatised as useless on the results of attempts at rat-trapping with traps into which entry is difficult, and from which escape is absurdly easy, or of attempts at poisoning with substances which possess taste or smell, or both, which is positively repulsive to rats.

1. *Rat Poisons.*—Poison if intelligently used can accomplish much: by means of a "poison campaign" a rapid reduction in the rat population can be effected. The chief disadvantage of the method is the nuisance caused by the decomposing bodies of dead rats, a nuisance which is small however when compared with the dangers of plague that rat infestation denotes. The selection of a suitable poison is the most important consideration. Most of the rat poisons on the market will kill rats if the rats can be induced to swallow sufficient, but most of them are distasteful or positively repulsive to rats. All phosphorus poisons possess this disadvantage; their inflammable nature also makes them objectionable. The most satisfactory of all poisons, and happily the cheapest, is barium carbonate. Barium carbonate (1) occurs in nature, unfortunately not in any quantity in India, and is a heavy white tasteless inodorous powder that is almost insoluble in water. As a rat poison it is certain in its action and safe to handle. When mixed with flour and water it in no way makes the mixture less palatable to rats, who seem quite unable to detect its presence in spite of their singularly acute attributes of taste and smell. Poison baits are best made as follows:—

One pound of powdered native barium carbonate is mixed thoroughly in an enamelled basin with three pounds of flour made from the grain which constitutes the staple food of the locality in which operations are to be carried out. Sufficient water is added to make the whole into a fairly firm paste. The resulting mass is sufficient for some 2,400 baits, each containing three grains of poison, which are conveniently rolled into pill form. Clean hands and dishes are necessary to avoid imparting to the baits extraneous taste and odour which may diminish their attractiveness. Baits should be made fresh each day as a hard stale bait is rarely eaten by the rat.

Poison baits made in the manner described should be laid in the evening, four baits on a small piece of paper being placed in situations readily accessible to rats but not so readily accessible to children and domestic animals. (2) Twelve baits, three groups, will be found generally sufficient for an average-sized Indian room. A careful record of the baits set should be kept, and in the morning all unconsumed baits should be collected and destroyed, note being made of the number consumed, wholly or in part, and the dead rats found should be counted and destroyed. This process can be repeated daily until no more baits are consumed. Another baiting of the village or town can be carried out some two weeks later. When baiting is being carried out special efforts should be made to encourage householders to keep all other available food for rats covered up, especially at night. In laying baits the presence of rat-holes, or other indications of the presence of rats, will afford useful indications as to where baits can be laid with most chance of success.

(1) The carbonate is the only salt of barium that should be used. Barium sulphate or barytes, the most common barium salt, is valueless as a rat poison.

(2) Fifteen grains of barium carbonate will frequently kill a cat; 20 grains is fatal to chickens. Dogs can withstand a dose of 140 grains.

If rat-poisoning be carried out with careful attention to all these details, a very notable degree of success will be achieved, with very appreciable benefit when plague threatens.

**Trapping.**—To effect a considerable diminution in the rat population and to keep it at a low level by means of trapping is a relatively expensive measure and one that requires careful and intelligent supervision if results commensurate with the outlay are to be secured. It is a measure, however, that usually excites less opposition than does the use of poison baits, and if trapping operations be conducted with energy and with due regard to detail they are of very considerable value as a plague-preventive measure.

Many rat-traps on the market are defective in design and construction. Traps selected haphazard have very varying degrees of efficiency, and recent observations have shown that the size of the trap, the size of the inlet, the strength of the trap, the accuracy with which the flap fits the frame designed for its reception, are all important points in determining the efficiency of the trap. Other things being equal, the larger the diameter of the inlet the more satisfactory the trap. Experiments designed to determine the type of trap best suited to Indian requirements are now in progress, and it is hoped that specifications of the best all-round trap will soon be available.

Traps should be oiled only sufficiently often to ensure freedom from rust. Frequent washing of the traps is not recommended: rats are not attracted by cleanliness which appears to make them suspicious.

The traps are best baited with a small quantity of the staple food-grain of the community or of flour made therefrom in the form of dough. In the hot months, fresh green vegetables, notably cucumber, make an attractive bait.

To obtain the most economical results each house should be trapped once each week. One trap for every two rooms of an Indian house will probably suffice. All traps should be set overnight and collected early in the morning. All rats caught can be drowned or destroyed in some humane manner, their bodies being burnt. In the presence of plague, when a rapid reduction in the rat population is a matter of moment, more frequent trapping can be carried out with advantage. For systematic trapping a number of traps equal to 3 per cent. of the human population will be found sufficient. Frequent inspection of traps, with the rejection, for repair, of all found defective, is essential.

#### IV.—PROTECTION OF A COMMUNITY IN THE PRESENCE OF RAT PLAGUE.

**Inoculation and evacuation of infected dwellings.**—When plague has obtained a foothold in a town, or when plague threatens, it will be necessary to press the claims of inoculation with plague vaccine. It is not necessary to urge here the remarkable protection that inoculation affords to the individual; this is now well recognized. In the midst of an epidemic inoculation remains the most important of all plague measures.

Evacuation of infected dwellings should also be encouraged, provided always that accommodation for the people rendered temporarily homeless be provided in the vicinity. Wholesale indiscriminate emigration from infected to uninfected places is productive of much harm and should be actively discouraged. The inhabitants of towns and villages do well, in their own interests, to accord such plague refugees a cold welcome.

As long as things remain, as they are, these two measures, inoculation and controlled evacuation, will be as necessary and as important as they are at present. It must be remembered, however, that plague in India is a disease of rats, first and last, and that these very

valuable measures, inoculation and evacuation, designed to afford protection to the human population, do not strike at the root of the evil.

### RAT-KILLING OPERATIONS IN MAHABLESHWAR.

By ANNAJI V. GOKHALE,

SUB-ASST. SURGEON,

*Sub-Assistant Surgeon in charge of Rat-trapping Operations, Mahableshwar.*

THE rat-killing operations of Mahableshwar were introduced on the 1st of April, 1916. Mahableshwar has a special importance as it is a hill-station and the summer headquarters of the Bombay Government. Its height above sea-level is about 4,500 feet, and the annual rainfall is rarely below 250 inches. The population of Mahableshwar is ordinarily 4,115 but goes to about 8,000 during the hot season.

2. The whole of the municipal area is not trapped but only the town proper, including the bazar and the bungalows in close vicinity of the bazar. This trapping area of Mahableshwar consists of 400 houses and 25 bungalows, accommodating in all about 3,000 persons. For the sake of convenience, the trapping area has been divided into 6 wards and baiting is done on the seventh day.

3. All the traps are washed, oiled just sufficiently to prevent rusting, and baited twice a month, the baits used being dry coconut, which is rubbed daily on the inlet-wires of the traps to entice the rats. The traps in which rats have been caught are washed, oiled, and baited freshly.

4. In Satara, 'Wonder' traps of the Army and Navy Society had proved satisfactory, but as these were not available at the commencement of the operations, on account of the war, 'Calcutta Wonder,' 'Rawalpindi,' and 'Break-Back' traps were used until the 9th May, 1916, when 'Wonder' traps of the Army and Navy Society were introduced, and 'Calcutta Wonder' and 'Rawalpindi' traps were discontinued. The following table will show the comparative results of the rats caught in the different kinds of traps used.

| Kind of Trap.                         | Number of traps set. | Number of rats caught. | Number of rats caught per 100 traps. | REMARKS. |
|---------------------------------------|----------------------|------------------------|--------------------------------------|----------|
| Break-Back ...                        | 19,345               | 1,806                  | 9.3                                  |          |
| Rawalpindi ...                        | 1,548                | 111                    | 7.2                                  |          |
| Calcutta Wonder ...                   | 449                  | 1                      | 0.2                                  |          |
| Wonder, of the Army and Navy Society. | 22,864               | 3,124                  | 13.7                                 |          |
| TOTAL ...                             | 44,206               | 5,042                  | 11.4                                 |          |

From the above table it will be seen that the 'Wonder' traps of the Army and Navy Society

have given greater satisfaction than the other varieties of the traps. It may here be mentioned that 'Break-Backs' if used continuously for a long time fail to deceive the rats. So these traps were used at long intervals. The two disadvantages of the 'Break-Back' trap are that it kills the Musk-rat also—the natural enemy of the rats—and it is dangerous if the children happen to handle it, though no accident whatever has hitherto happened in Mahableshwar from its use. 'Calcutta Wonder' traps have not given satisfactory results. It has also been noticed that trapping a house consistently more than once a week has no advantage. As may be expected, a large number of rats were caught in the grain-shops, godowns, and dark and ill-ventilated houses.

5. The rat-killing operations have been in progress here for the past 21 months, and for easy reference and comparison this period has been divided into seven parts of three months each, and the figures have been tabulated accordingly (*vide* Tabular Statement below).

6. On a reference to column 4 of the Tabular Statement, it will be seen that the number of rats caught—increased during the two monsoons. This increase in the first monsoon was partly due to the use of the 'Wonder' traps (these were introduced from the 9th May, 1916) instead of the other traps. From experience gained here, it may be said that no trap of a single pattern will continue to catch rats for a long time, and so different traps having different shapes, if tried, might give better results.

7. On reference to columns 5 and 6, it will be seen that the number of female rats killed is larger than that of males, and this is evidently a happy feature of the rat-trapping operations of Mahableshwar, though no credit could be claimed by anybody for it. It is not known if the preponderance of the female rats over their males is general or has only been accidental here.

8. On a reference to column 8, it will be seen that the average number of fleas per each rat increased in the monsoon, and this seems to be the breeding season of the rat-fleas in Mahableshwar. The variation of the average number of fleas per each rat between the two monsoons cannot be explained.

9. The practice of keeping tame cats in houses materially influences the reduction of the rat population. In ward No. 6 there are 77 houses and 22 cats, and the average number of rats caught per house, for a quarter, was 1.6.

10. This year plague broke out in Mahableshwar and in all 16 cases occurred (excluding the two imported), of which only 2 occurred in the trapped area and the remaining 14 in the untrapped area. On the occurrence of the first case of plague in Mahableshwar, only people in the bazar evacuated. Of those in other localities such as Dhavad Alli, Kolli Alli, Gowalli Alli, etc., the majority of whom were not inoculated; none left their houses, and as no case of plague occurred in these localities, it appears reasonable to infer that the diminished number of rats in the said localities, where rat-trapping was going on regularly, was to some extent responsible for keeping the plague off from them; and acting on this inference, rat-trapping has been started in the whole municipal area of Mahableshwar since the middle of last December.

11. A large number of white-bellied jungle rats abound in the jungle round about Mahableshwar, and as these cannot be controlled when once the infection is introduced amongst them, they form a very powerful medium for spreading the infection, especially to the outside bungalows.

12. I am much obliged to the Surgeon-General with the Government of Bombay for granting me permission to publish this 'Note.'

*Tabular Statement showing the Result of the Rat-trapping Operations at Mahableshwar from 1st April, 1916, to 31st December, 1917.*

| Period of the rat-killing operations |           | Total number of traps set. | Total number of rats caught. | Total number of |              | Percentage of the rats caught to the total number of traps. | Average number of fleas per each rat. | Proportion of female rats to 100 male rats. | Number of rats caught per |      |
|--------------------------------------|-----------|----------------------------|------------------------------|-----------------|--------------|---|---------------------------------------|---|---------------------------|------|
| From                                 | To        |                            |                              | Male rats.      | Female rats. |   |                                       |   | House.                    | Man. |
| 1                                    | 2         | 3                          | 4                            | 5               | 6            | 7   | 8                                     | 9   | 10                        | 11   |
| 1-4-16                               | 30-6-16   | 13,678                     | 1,735                        | 798             | 937          | 12.7  | 1.8                                   | 117.4                                       | 4.1                       | 0.6  |
| *1-7-16                              | 30-9-16   | 16,181                     | 2,084                        | 830             | 1,254        | 12.9  | 4.0                                   | 151.1                                       | 4.9                       | 0.7  |
| 1-10-16                              | 31-12-16  | 14,275                     | 1,221                        | 472             | 749          | 8.6   | 2.7                                   | 153.7                                       | 2.9                       | 0.4  |
| 1-1-17                               | 31-3-17   | 11,624                     | 865                          | 381             | 484          | 7.4   | 1.6                                   | 127.0                                       | 2.0                       | 0.3  |
| 1-4-17                               | 30-6-17   | 11,052                     | 964                          | 435             | 529          | 8.7   | 1.8                                   | 121.6                                       | 2.3                       | 0.3  |
| †1-7-17                              | 30-9-17   | 8,891                      | 1,153                        | 501             | 652          | 13.0  | 1.9                                   | 130.1                                       | 2.7                       | 0.4  |
| 1-10-17                              | 31-12-17  | 11,928                     | 409                          | 181             | 228          | 3.4   | 1.6                                   | 126.0                                       | 1.0                       | 0.1  |
| TOTAL ...                            | 21 months | 87,629                     | 8,431                        | 3,598           | 4,833        | AVERAGE.  |                                       |   |                           |      |
|                                      |           |                            |                              |                 |              | 9.5   | 2.2                                   | 133.1                                       | 2.8                       | 0.4  |

\* First monsoon.

† Plague broke out during the monsoon of 1917. (Second monsoon.)

‡ 3,000 is taken as the number of population residing within the trapped area, consisting of 400 houses and 25 bungalows.

## NOTES ON PLAGUE INOCULATION.

By C. J. GHIA,  
ASST.-SURGEON.

My plea for writing this article is, that some inoculators do not seem to understand the theory and practice of plague inoculation, with the result that it is not carried out so extensively as it should be. The success of inoculation, in a particular town or area, depends upon (1) the education of the people, and (2) the popularity of the inoculator. If the people are sufficiently educated to understand the benefits of inoculation, so that, in a particular town, most of the population is inoculated just before the advent or in the beginning of a plague epidemic, the epidemic is reduced to a sporadic form. If, on the other hand, people are ignorant and superstitious, the work of the inoculator turns out a trial. It is in such a case that the people have to be repeatedly preached to and exhorted and the popularity of the inoculator will score a great deal.

The inoculator, if he wants to be popular, and gain the confidence of the public, should exhibit a calm, pleasant, and cheerful disposition. He should show the people that he is doing his work with pleasure, and does not consider it a burden, as also that he is doing everything with thoroughness, precision, and confidence. Almost every day at the time of inoculation he will be attacked with a number of questions, which he must answer to the askers' satisfaction, as by so doing hesitating people come round and the number of inoculations is increased. In spite of this, there will remain some irreconcilables, who will even go to the length of ridiculing him, and asserting without rhyme or reason that inoculation is a great humbug. With these he should not be annoyed but treat them with the silent contempt which they deserve.

The inoculator must in the first place get himself and his family inoculated. This will set the ball rolling, and, secondly, he should request the heads of offices, workshops, mills, factories, etc., to get themselves inoculated before their employes. This takes away the fear which the masses entertain and instils confidence in them. Another plan is to carry out inoculation in the midst of bazars and populated areas, where a beginning should be made on some plucky individuals, who would thus serve as advertisers. The great advantage of carrying out inoculation in a street is that a number of females and children can be induced to undergo inoculation at their own places. Females in India do not like to go to a hospital or a fixed inoculation station for inoculation, as any inoculator of some standing might have noticed. It is admitted that females are more exposed to infection than males, because the former in India mostly keep indoors, without fresh air and exercise, unlike the latter; and because they have to

go into dark places and corners, where infection generally lurks, to sweep floors and clean houses. It may, therefore, be reasonably urged that females should be the first to be inoculated. In connection with street inoculation, it is also a good plan if one or two educated men go round the street and explain the benefits of inoculation, while the inoculator is doing his work. By following this procedure, another 50 to 100 persons, who would not otherwise have thought of going to an inoculation station, may undergo inoculation.

Now, as regards objections, ignorant people will tell you that attacks and deaths have also been occurring among the inoculated; but they fail to understand that the immunity conferred by inoculation is not absolute. In the first instance, the attacks among the inoculated are few, and they are more likely to recover, unless the infection be very heavy and the resisting power of the individual much lower than their uninoculated brethren. The percentage of deaths is six to eight times greater among the uninoculated. The immunity conferred by inoculation is marked within the first six months, though it may last for two years. Accordingly, re-inoculation is advised, whenever a plague epidemic reappears; but there is not the least truth in the excuse that people once inoculated are more prone to attacks of plague in subsequent epidemics. Again, objections have been put forward that inoculation produces rheumatism, leaves a permanent weakness in the arm inoculated, makes the virile power less potent, introduces poisons of syphilis, leprosy, tubercule, etc.; and leaves a lump behind which is painful and lasts several months. The last two depend upon imperfect sterilization and faulty introduction of the needle, and they can be eradicated by following the procedure strictly. The other objections are imaginary and have not the least foundation. Some people object to being inoculated during an epidemic of plague or when they are nursing a plague-stricken member of their family, believing that they are more exposed to infection by being inoculated, and that if they are incubating plague inside their body, inoculation will bring on an attack, and which would invariably prove fatal. Experience has shown that there is no truth in such a belief. On the other hand, such persons should get themselves inoculated at once when they have to be constantly near a plague patient, who may prove a source of danger to them at any time. Of course, immunity is not so marked, and chances of recovery are not so great, in such cases. If, for instance, a man is inoculated on the 4th day after infection, he does not get so much immunity as he would have got had he been inoculated on the 3rd, 2nd or 1st day after becoming infected. It may then be said that even during the incubated period, inoculation does no harm,



but rather to a certain extent controls the severity of the disease; and that the sooner a man is inoculated, the greater is the immunity, and the better are the prospects of recovery for him.

Lastly, the bending, breaking, and reinsertion of the needle, the introduction of it with hesitation, the clumsy way of handling the syringe while injecting the fluid, and the imperfect sterilization of the syringe, the needle and the arm of the patient, are to be scrupulously avoided.

Now I come to the technique to be followed in inoculation. This is clearly laid down in the pamphlet issued by the Bombay Bacteriological Laboratory. But in addition, attention of inoculators is drawn to the following points:—

(1) When the mercury of the thermometer rises to 160°F., fill in the syringe with the hot vaseline, and eject it four times at least. I have seen some inoculators partially filling the syringe and moving or shaking the vaseline. This is certainly a very imperfect way of sterilizing the inside of the syringe. I insist upon the drawing in and ejecting of vaseline four times at least, as this will leave no room for doubt regarding the sterility of the inside of the syringe.

(2) The dissecting forceps, which is used to fish out a needle, should have been passed several times through the flame of a spirit lamp.

(3) The needle should be adjusted firmly to the syringe.

(4) In cold weather, vaseline clogs in the needle or the end portion of the syringe. The clog can be melted by dipping the needle or the end of the syringe in hot vaseline for some time, and until passage becomes clear. In warm weather the metal portions of the syringe become so hot as to scorch the fingers. A piece of lint dipped in carbolic lotion used to handle the syringe with, will prevent this.

(5) When the sterilization of the syringe and needle is over, a tube of anti-vaccine is to be taken and thoroughly shaken. The neck is then turned round in the flame and the end knocked off by a dissecting forceps, and sterilized by passing it several times through a flame. Under no circumstances is the neck to be broken by crushing it with pincers or forceps; because this will carry particles of glass in the serum to be injected. The neck is now passed into the flame and the serum is ready to be drawn in the syringe.

(6) A tube that has a crack or a flaw in it is to be discarded.

(7) Instructions regarding dosage on the vaccine tube should always be read and carefully attended to.

(8) When inoculating a large number of persons, at one time, it is not, of course, necessary to waste the 4 c.c. of serum at the opening of every new vaccine tube.

(9) Sterilize the left arm of the patient in the middle of its back by tincture iodine, made up of equal parts of tincture of iodine and liniment of iodine, two minutes before injection. This is a very speedy, convenient and effective method when inoculating a large number of persons.

(10) Keep the arm of the individual to be operated upon lax by flexing the forearm at the elbow to a right angle, and by keeping the arm at an angle of 45° from the side of the chest.

(11) Go behind the left arm of the individual and pinch up the middle portion of the skin of the left arm with the thumb and fingers of your left hand, and with the syringe in your right hand insert the needle from above downwards and inject the serum slowly

into the subcutaneous tissues, *i.e.*, in the superficial fascia or in between the superficial and deep fasciae, but *never* into the layers of the skin, or the muscles. The needle should be made to withdraw gradually as the serum is being injected and the left hand taken off; so that the serum is diffused over a greater area than would be the case if the needle was kept stationary and the left hand kept on. The other advantages are that the serum is easily and quickly absorbed, leaving no lump behind; and the tearing sensation that is experienced if the needle is kept stationary is never felt. The needle must be inserted in a slightly slanting direction almost parallel with the skin surface. The sharpest of needles must be used, as when once the point of the needle has pierced the skin, the whole needle goes in as it were by the weight of the syringe. The bevelled portion of the needle must always be kept towards the inoculator.

(12) The needle is to be taken out after the injection, and a piece of cotton wool dipped in carbolic lotion (1 in 40), applied over the seat of puncture and the area massaged with the fingers, over the cotton-wool, for about half a minute, so that the serum is diffused and absorbed, leaving no lump behind.

(13) The temperature of the vaseline should be constantly kept at 160°F., as it is required to sterilize the needle every time after insertion.

After enumerating the above points, I come to the difficulties which are experienced by beginners in inoculation and how to meet them. Difficulty is experienced in introducing the needle. They either bend the needle, break it, or insert it with great hesitation, so that much needless pain is caused. The insertion of the needle is just like passing a catheter into the urethra. It goes in by the weight of the syringe once the skin is punctured, and to puncture the skin a slight quick thrust in the axis of the needle is necessary.

Great care is needed not to introduce the needle into the layers of the skin.

There is some clumsiness in handling the syringe on the part of some inoculators, with the result that the inoculation takes a longer time and is never done with that lightness of hand which is got if handled properly. The needle is to be introduced by holding the syringe lightly in the right hand in very much the same way as a shoemaker holds his awl. When this has been accomplished the right hand changes its position and its index and middle fingers are separated to catch the syringe beneath its rim, and the thumb is introduced into the ring of the handle. By this procedure, the serum is introduced without any awkwardness. Sometimes it happens that in the act of injecting the piston refuses to move. This is generally due to a plug of vaseline in the needle. In such an event the needle is to be withdrawn, dipped in hot vaseline, until the plug dissolves. One should make oneself sure, however, before reinsertion of the needle, that the serum flows. It also sometimes happens that owing to some impediment to the flow of the serum, the serum instead of being injected



into the tissues makes its way behind the rubber plunger, while the individual receives little or no dose at all. This mistake has to be guarded against by removing any obstruction. In other cases, the serum leaks out through the upper end of the rod provided with a screw-disc to tighten or loosen the rubber plunger. This can be set right by manipulating the screw-disc.

In inoculating a number of persons it occasionally happens that some weak-minded persons amongst them faint. This is not due to the effect of the serum, as some people suppose but at the sight of blood or at the introduction of the needle into the skin. It is always wise to inoculate such persons, especially women, in the sitting posture, or to make them sit down after inoculation, as a fall from a standing position may produce severe injuries.

Questions have been frequently asked as to whether inoculation can be done in the skin of the chest, buttock or thigh. I have no personal experience of these sites, but in cases where inoculation in the arm is contra-indicated for any reason, it can be done in the skin of the chest. Inoculations in the skin of the buttocks and thigh would necessarily incapacitate the individual from walking for several days.

Can inoculation be done to persons suffering from disease? The answer is that it can be done, unless the disease is advanced and in an acute form. In chronic diseases which have not advanced, and the resisting power of the individual is not very low, inoculation can be carried out in half-doses at the interval of a week. Pregnant women can be inoculated up to seven months without any harm to the mother or foetus. The pamphlet on plague inoculation issued by the Bombay Bacteriological Department rightly lays great stress on the necessity of inoculation of pregnant women. Even the youngest children can be inoculated without any harm. The symptoms produced, after plague inoculation, begin within four to six hours; but in many cases the arm begins to feel heavy after an hour. Generally, a sensation of mild chill begins, lasting from 10 to 15 minutes, and fever follows. The fever rarely goes beyond 102°F.; in the general run of cases it shoots up to 100°F. There is a sensation of dull pain, malaise and heaviness all over the body. The site of inoculation becomes swollen, tender, and red, and the movements of the forearm and arm are restricted to a greater or less extent. In susceptible individuals, vomiting occurs, but it is a rare symptom. The fever lasts for 24 hours, and with fresh vaccines a couple of hours longer. The swelling and pain subside within 4 or 5 days. In persons, in whom the inoculation has unfortunately been done in the layers of the skin, the focal and general reactions are greater and last some time longer. Usually a person

can attend to his business on the 3rd day; but in favourable cases, work can be attended to even on the 1st or 2nd day. If the reaction is severe and lasts long, a purge and a little quinine will be useful.

What is the best time for inoculation? In selected cases where a hypnotic can be taken at bedtime, four o'clock in the afternoon will be the best time, as the hypnotic will, by producing sleep, mask all the symptoms till morning, when the fever is tailing off. If inoculation is done in the morning, symptoms come on in the middle of the day, and so the rest of the day is passed in restlessness and pain, thus interfering with work.

WADHWAN CAMP, }  
14th June, 1918. }

### DISCUSSION ON THE TREATMENT OF MALARIA.

(Continued from p. 249, July, 1918, I. M. G.)

(Additional remarks.)

By COLONEL SIR RONALD ROSS, K.C.B., K.C.M.G.,

Consultant in Malaria, War Office.

15th March, 1918.

1. I have recently received a very interesting document from the D. M. S., Salonika, giving the results of enquiries on the treatment of malaria which he has made among a large number of Medical Officers serving there, all of whom have constantly been treating malaria cases and supervising quinine prophylaxis. I am allowed to give the following brief summary of the opinions expressed by these Medical Officers on various points at issue:—

A. The Medical Officers were asked for their opinion regarding the value of 10 grains of quinine given twice a week as a prophylactic measure. Out of 111 Officers who have expressed definite opinions, 2 stated that this dosage of prophylactic quinine is of great value; 2 stated that it is of definite value; 10 stated that it is of some value; 16 that it is of very little value; 72 that it is of no value; and 7 that it is of no value and objectionable, because it renders the parasites immune and masks the symptoms. One Officer said it was of use against benign tertian and not against malignant tertian. Five Officers thought that the minimum dose of any prophylactic value should be 10 grains daily. In addition to these 111 reports, 4 Officers confessed to being uncertain. Thus out of the 111 Officers, 71 per cent. considered that 10 grains of quinine given twice a week as a prophylactic measure is of no value or is objectionable.

B. The Officers were next asked to give their opinion regarding the optimum dosage for treating relapses of malaria in Regimental Aid Posts, where patients are under treatment for a period not exceeding 3 days (patients whose fever exceeds that period being sent further back). Out of 111 Officers who expressed definite opinions, 1 advised 80 grains of quinine daily; 6 advised 60 grains daily; 13 advised 45 to 50 grains daily; 14 advised 35 to 40 grains daily; 70 advised 30 grains daily with subsidiary treatment; 4 advised 20 grains daily; and 3 objected to any optimum dosage, but thought that each case must be treated on its merits. Thus the large majority of the

Officers, namely 63 per cent., are in favour of 30 grains daily, though 4 advised an increase of 45 grains daily if necessary, and 1 advised 15 grains every 4 hours until the temperature falls.

C. Asked what is the optimum dosage for recurrent cases of malaria now doing duty after they have been kept in Regimental Aid Posts for a few days—107 Officers report as follows: Nine recommended the complete stoppage of quinine unless relapses occur, the treatment being confined to arsenic, iron and other tonics; 73 recommend that fixed doses of quinine should be given for periods varying up to 3½ months; and of these 73 Officers, 26 recommend 10 grains daily, 21 recommend 20 grains daily, and 26 recommend 30 grains daily. But 25 Officers recommend graduated courses under which the quinine dosage is reduced as the course progresses. Three Officers recommend 30 grains daily for 10 days, followed by 20 grains daily for another 10 days; 10 Officers favour 30 grains daily for 1 to 3 weeks, followed by 20 grains daily for 1 to 3 weeks, and 10 grains for the remainder of the course of 3 to 3½ months. Five Officers recommend 10-30 grains for 2 to 4 weeks; 25 Officers suggest various weeks, and then 5 grains daily. The remainder prefer other lines of treatment.

D. Asked what is the optimum dosage for recurrent cases of malaria on return from Hospital, out of 105 Officers, 16 recommend the complete stoppage of quinine unless relapses occur. Sixty-five Officers advise the same daily dose of quinine given for various periods. Of these, 33 advise 10 grains daily for from 1 to 3½ months; 12 advise 20 grains daily for similar periods, and 16 advise 30 grains daily. Thirteen Officers advise various courses of treatment in which there is a gradual reduction of the quinine as the course progresses.

2. Subsidiary treatment is of course recommended by many Officers; others suggest the continuance of the quinine until the end of the malaria season; and others make numerous suggestions which cannot be included in a summary like this.

#### THE TREATMENT OF MALARIA.

1. Apparently the best treatment for old cases of malaria which has yet been in use in the Southern, Eastern and Aldershot Commands, and London District (at least to judge by the small number of cases which are known to have relapsed after the treatment was given), has been treatment C. 17 [recorded in my interim report on the treatment of malaria, finally dated 4th March, 1918, 24 General Number (A.M.D. 2.) (6198)], devised by Captain Meredith Harrison, R.A.M.C., in charge of the malaria cases at the Connaught Hospital, Aldershot. This treatment was used by him between the 10th July and the 16th October, 1917, for 49 chronic cases of malaria, mostly of benign tertian, and mostly arrived from Salonika. Of these, only 5 had relapsed after the cessation of treatment in October until the end of February, 1918, when I inspected a large number of cases. It may be added that three-fourths of these cases have been examined since their original treatment at the Connaught Hospital once a week as regards their clinical condition, their blood, and their weight; and as most cases of malaria in the Aldershot Command are closely in touch with the Connaught Hospital I think that the number of cases which relapsed (given above) is accurate. The percentage of cases relapsing as given by these figures is therefore only 10·2 per cent. The time which elapsed between the end of the treatment and the beginning of the relapse (in the 5 cases which did relapse) varied from 16 to 72 days, and averaged 34·5 days. Captain Harrison reports that with this treatment the fever was reduced within from 12 to 24 hours, and that no asexual parasites could be found after 48 hours. The effect of the treatment as regards general improvement of health was good. The treatment was

well borne by the patients, except for deafness and tinnitus, and there was very little vomiting; but the patients always object to stopping in bed for 12 days.

2. The treatment was as follows:—The patient is put to bed for 12 days and given daily the following treatment for all this period, namely, grains 15 of the bi-hydrochloride of quinine intramuscularly in each deltoid muscle, together with grains 10 of hydrochloride of quinine in mistura antieachexia No. 1, thrice daily—totalling 60 grains of quinine daily for the 12 days. After this the patient is allowed up and is given mistura antieachexia No. 2 four times a day, that is 60 grains of quinine daily by the mouth, this treatment being continued for 3 days. After this the patient is given mistura antieachexia No. 3 four times daily for 14 days—that is, 20 grains of quinine daily, the patient being allowed to do light work all this time. Captain Meredith Harrison's prescriptions for mistura antieachexia No. 1 No. 2, No. 3, are appended below.

3. It will be useful if medical officers in charge of malaria cases would follow this treatment exactly as laid down by Captain Meredith Harrison and report the results as regards relapses to me.

#### CONNAUGHT HOSPITAL, ALDERSHOT.

##### FOR THE TREATMENT OF MALARIA.

##### *Mistura Antieachexia No. 1.*

|                             |     |     |         |
|-----------------------------|-----|-----|---------|
| R                           |     |     |         |
| Quinine Hydrochlorid.       | ... | ... | gr. x.  |
| Tinct. Ferr. Perchlorid.    | ... | ... | m. v.   |
| Liq. Strychnia B. P.        | ... | ... | m. v.   |
| Liq. Arsenic. Hydrochlor.   | ... | ... | m. v.   |
| Acid Nitrohydrochloric dil. | ... | ... | m. v.   |
| Magnes. Sulphat.            | ... | ... | dr. ss. |
| Syrup Tolu.                 | ... | ... | dr. ss. |
| Glycerine                   | ... | ... | m. x.   |
| Aqua, ad                    | ... | ... | oz. 1.  |

*Sig.*—For a dose: to be given, as directed, after food.

##### *Mistura Antieachexia, No. 2.*

##### As No. 1, but add—

|                             |     |     |        |
|-----------------------------|-----|-----|--------|
| Quinine Hydrochlorid.       | ... | ... | gr. v. |
| Acid Nitrohydrochloric dil. | ... | ... | m. v.  |
| to the dose.                |     |     |        |

##### *Mistura Antieachexia, No. 3.*

##### As No. 1, but reduce—

|                             |     |     |        |
|-----------------------------|-----|-----|--------|
| Quinine Hydrochlorid.       | ... | ... | gr. v. |
| Acid Nitrohydrochloric dil. | ... | ... | m. v.  |
| in each dose.               |     |     |        |

R. MEREDITH HARRISON,

T. CAPT., R.A.M.C.,

*M. O. in charge of Malaria.*

CONNAUGHT HOSPITAL.  
31st December, 1917.

#### ANTIMALARIAL MEASURES IN RELATION TO THE HUMAN CARRIER.

BY W. B. ORME, M.D.,

*Lower Perak, F.M.S.*

THIS memorandum has been composed as the result of a conversation between Mr. E. S. Hose (District Officer, Lower Perak, Federated Malay States) and the writer, whose views on the prophylaxis of malaria differ in many essentials from the routine methods of anopheline reduction, at present almost the sole means employed in

dealing with the disease in this country. It is common knowledge that the sick-rate and death-rate from malaria are truly appalling, and if means can be devised for dealing with the malady in a more efficient and economic manner the achievement will be great. Mr. Hose has kindly given very considerable help in the framing of the memorandum, especially in regard to the proposals for dealing with immigrants; furthermore, by his criticism he has enabled the writer to present the subject in a manner intelligible to the layman.

Antimalarial warfare in the Federated Malay States has in the past been almost entirely centred on mosquito-reduction methods; money has been lavishly expended in certain places on what appeared at the time to be the best methods for reducing the pestilence, while authorities are agreed that even to maintain the modicum of improvement so far attained large annual budgets will be a constant necessity.

In fairness it must be mentioned that large sums have also been expended on quinine distribution, but it must be pointed out that, in the opinion of many, unsystematic and unintellectual dosing with quinine, taken in just sufficient quantity to cause temporary disappearance of the symptoms, is probably harmful and greatly increases the number of carriers (*viz.*, those human beings harbouring the gametes or sexual forms of the parasite) by rendering vegetative reproduction difficult and so inducing gametocyte formation.

There are two theories, representing two schools of thought, as to the biological explanation of relapses in malaria. The first may be stated as follows. It is the rule in ordinary sexual reproduction that the cells of either sex are individually incapable of development, this taking place only after the cells of both sexes have united; however, in many algæ and protozoa the sexual cells may germinate independently, the female gametes being especially liable to develop in this manner. Such development of the organism from female gametes is known as parthenogenesis, and is believed by some to be the chief factor in the relapses of malarial fever. The theory is, in fine, that certain of the female gametes become ensconced in remote portions of the body such, for example, as the extremities of the long bones, and there remain dormant, probably in small numbers, while the human host is enjoying normal health and vitality; but whenever the host's powers of resistance are lowered, the process of parthenogenesis may take place, and these hidden gametes become transformed into the non-sexual forms of the organism or possibly sporozoites which, in sufficient numbers, will cause fever.

It is here necessary to mention that sporozoites are minute falciform bodies, offspring of the

sexual union in the insect host, which, when injected by the mosquito into the human blood-stream enter the red blood cells and give origin to the non-sexual cycle. Biologically it seems more probable that the female gamete would revert to this form rather than to the fully developed sporulating body as assumed by Schaudinn.

The second theory is that the continuance of the vegetative cycle of the non-sexual forms of the organism in the blood-stream, in numbers insufficient to cause actual fever, is the explanation of the relapses; that is to say, that the cycle of the non-sexual forms is perpetuated in small number during a healthy period in the life of the individual, but on the advent of lowered vitality increases to an extent sufficient to produce an attack of fever. One must own that when a case of malarial fever relapses after a period of years, the former theory appears a plausible working hypothesis if the chance of fresh infection has been absolutely excluded.

It is, perhaps, advisable here to insist, for the information of laymen, on the following important fact in connection with the spread of malaria, although this is, of course, thoroughly well known to the medical faculty. It is only by the passage of gametes of both sexes from the human to the mosquito host that the continued biological existence of the organism is possible, because it is only in the body of the mosquito that sexual union of the gametes can take place. This being made clear, it becomes obvious that persons having the gamete forms in their blood are the *only possible human carriers* of malaria, and that concentration of treatment on such cases offers a solution of the problem of getting rid of malaria, which is much more hopeful than the attempted extermination or efficient reduction of anopheline mosquitos in a country like Malaya. The reason for this is as follows:—

The immediate effect of efficient quinine treatment is rapidly to destroy the non-sexual (fever) forms of the organism present in the blood, but it has, apparently, little or no direct effect on the sexual (gamete) forms. It is, however, believed that quinine treatment, in sufficient doses actually reaching the blood stream, carried out over a period of two months, with possibly short intermissions, will have the effect, in the great majority of cases, not only of destroying all the non-sexual (fever) forms in the blood, but also of getting rid of all the gametes; though whether this latter result is really due to direct destruction by the quinine or by the transformation by parthenogenesis of gametes into non-sexual forms or sporozoites, which are in their turn destroyed by the quinine, or even, perhaps, that the gametes die a natural death when their source (non-sexual form) is entirely cut off, depends on one's acceptance of one or

other of the theories advanced. It may be stated here that the method of quinine disinfection advocated, of allowing a few days' interval in the treatment after each complete week of dosing, is by no means admitted by all, many authorities believing continuous drenching to be the better course. Experience seems to show, however, that both methods will bring about a satisfactory cure, the real essentials being the large doses, prolonged course, and thorough absorption.

It remains to be considered how practical effect can be given to the proposal to fight against malaria through the human carriers of the disease rather than through the infinitely more elusive mosquito carriers.

It may safely be asserted that not more than 10 per cent. of the population of the country have malarial parasites in any form in their blood, and it may with equal confidence be claimed that not more than one-tenth of these are infected with gamete forms. These estimates are undoubtedly high, but it is better to be on the safe side in such matters. The identification and systematic treatment of this 1 per cent. of the population so as to eradicate gametes from their blood should not prove an insuperable task, nor one that is comparable in expense or uncertainty with that of attempting the extermination of anophelines, or even their permanent reduction, which is stated to be sufficient to abolish malaria. The factors of immigration and internal movements of population, it must be admitted, add very considerably to the difficulties of the problem, but even these should not be incapable of solution.

It is not suggested to adopt methods of segregation or quarantine, but rather those of home treatment. It is essential to the efficient working of the scheme, however, that the addresses of all persons coming within its operation should be known to the medical officers appointed to carry it out. In the case of people residing in the country this information would be obtained and recorded in the first instance by a travelling microscopist, to be appointed for each district, in the course of his initial investigations.

In the case of immigrants, it will be necessary to legislate for the compulsory notification to Health Officers of the names and addresses of *all classes of passengers* disembarking at any of the ports of the Colony or of any of the Malay States. This would not of course apply to local passengers travelling between different ports of British Malaya. Labourers and others who are subjected to quarantine might be examined in detail during the period of their quarantine and only those proved to be gamete carriers need be notified. The procedure in the case of passengers not quarantined would be for the Health Officer on receipt of the names and addresses to instruct the local microscopist to visit the declared

addresses of each passenger arriving in the district, and to make such enquiries as might be necessary, and to report the action taken. In certain cases a few personal enquiries would be all that is necessary, whereas in others detailed investigation and blood examination might be required and might also have to be followed by systematic quinine treatment. It would therefore be necessary to provide statutory powers for the examination and treatment of persons, including the taking of blood films and the administration of quinine.

It is suggested that these powers should be secured by a provision to the effect that any person who refuses to submit to examination and treatment by the Officer appointed for the purpose will be liable to be committed, on the order of a Magistrate, to a Government hospital for treatment for a period not exceeding three months. It should be open to any person to appeal from the decision of the microscopist to the Health Officer before proceedings are taken before a Magistrate.

It may be objected that these proposals are somewhat drastic, but it must be remembered that every person with gamete parasites in his blood is a menace to the community, and his compulsory detention in hospital, in the rare cases in which examination and treatment would not be consented to, would be no greater hardship than quarantine measures which have been recognised as necessary for many years for the prevention of the spread of other contagious diseases. If it is considered either impolitic or impracticable to impose the obligations on immigrants that have been suggested, the writer is satisfied that, even so, very great benefits would accrue to the community from the application of these proposals to the resident population only, without regard to the factor of immigration. Indeed, he would go so far as to express the belief that their application to a single district by way of experiment would be more than justified by the results.

It is not proposed for the present to make any detailed recommendations as to the staff and expenditure which will be required for this scheme, as it is felt that it would be better first to ascertain what sort of reception such novel suggestions for combating malaria are likely to receive in principle. Generally speaking the proposals would involve the appointment of a microscopist, with the qualifications of an Assistant Surgeon for each administrative district, and a sufficient number of subordinates under him to carry out personally the quinine treatment prescribed as a result of his investigations.

The duties of the microscopist have already been outlined above, and he would be under the general supervision of the Health Officer of the district. Each microscopist should be supplied with a suitable microscope and such accessories as



would be needed for taking blood films, staining, etc.

The appointment of Boarding Officers at Ports might also be found to be necessary, unless the services of the existing personnel could be utilized. It is the opinion of the writer that little or no use can be made of the services of Estate Visiting Medical Practitioners and Dressers in connection with these proposals, unless or until it is possible to exercise control over their work, which is at present not the case.

Since the above preliminary proposals were written and criticism of colleagues and others invited, the following difficulties have been put forward as likely to mar the project. It is objected that neither quinine, tartar emetic, methylene blue nor any other drug will rid the system of gametes, and if this is the case it is contended that the scheme is hopeless from its inception. Such a statement is a direct *suggestio falsi*, for the experience of the writer and others is in direct opposition to such a conclusion, and one may definitely state that, given an adequate quinine disinfection, carried out intermittently over a period of two months, the treatment will not fail,—not only will it quickly reduce the numbers of gametes to below one per cubic millimetre, but, in the great majority of cases, will cause their complete disappearance from the circulation. In this connection a statement of Darling's quoted by E. R. Still is not without profound interest, viz., that anopheline mosquitos do not tend to become infected unless the gamete-carrying man has more than twelve gametes per cubic millimetre in his blood. *It must here be mentioned that by adequate quinine disinfection is meant 10 grains of quinine bi-hydrochloride given in liquid form four times daily for a week, followed immediately by a week of complete intermission of the drug, after which the quinine is again continued in the same doses for a further week, and so on, until the two months' course is completed.*

Captain David Thompson, writing in the *Royal Army Medical Corps Journal* of July, 1917, makes some most interesting and significant remarks which may be quoted in relation to gametes and quinine; he says on page 18, "Crescent and other gametes gradually disappear under continuous routine quinine treatment. This is not due, however, to the direct destructive effect of quinine upon them. All that the quinine does is to stop the further production of crescents by destroying the asexual parasites from which they arise. The source of crescent is cut off, and those which remain gradually die off and disappear from the circulation within three weeks from the commencement of the treatment. At any rate they are reduced in three weeks to numbers less than one per cubic millimetre, so that the blood is no longer infective to mosquitos."

Referring once again to the two theories in respect to relapses, it is felt that both may be valid. It is, for instance, demonstrated that following an attack of malarial fever, inadequately treated, a period of prolonged pyrexia may occur, during which although the patient may aver himself fully cured yet the microscope will reveal non-sexual forms in small numbers in his blood; true, it may be necessary to scrutinise carefully several blood films before even one such parasite is found, nevertheless, such a finding taken in conjunction with the subsequent relapse of the attack, fully supports the second hypothesis. Another critic has pointed out that, if the second theory be correct and gametes can lie latent in remote situations in the body for long periods, it follows that such infected persons are a constant source of danger, in that during a period of lowered bodily vitality a few gametes may undergo parthenogenetic development and the general circulation of the individual may again become heavily infected. If the hypothesis be true such deduction is justified, but it must be remembered that the proposals in this memorandum are not expected to bring about an utopia but simply to show a means whereby we may reduce the incidence of the pestilence, give a reasonable guarantee of cure, and render the great bulk of the gamete-carriers non-infective to the insect hosts.

The point perhaps to be most insisted on is that by carrying out the campaign advocated one will be able to break the vicious circle in the biological life of the parasite by a means which will not be prohibitive in cost, which will in fact be both economical and practical.

Possibly it may not be out of place to mention here quinine prophylaxis. In the writer's opinion it is a *modus operandi* to be utterly condemned as *ordinarily carried out*; the method most usually employed is to administer five grains of quinine daily and a double dose on one day of each week; this unfortunately will by no means prevent infection, but is on the other hand sufficient to produce an abundance of gametes in those who have chanced to become infected. *Probably no dose of quinine which is not actually curative will be to any extent protective*, and it is further obvious that curative doses could not possibly be continued over periods of months and years. Possibly, should it be necessary for an individual to pass some few nights in a highly infected locality, it would be judicious for him to take quinine in curative doses during the time; but under no other circumstances would the prophylactic methods of taking quinine be justified.

In conclusion, the writer ventures to reiterate his strong conviction that, unless the campaign against malaria is strengthened by an attempt to reduce, and, if possible, to destroy its incidence by dealing with the human carriers of the



disease, the efforts at present exercised by Government are doomed to failure.

## A Mirror of Hospital Practice.

### NOTES ON CASES OF SURGICAL INTEREST.

BY F. POWELL CONNOR, D.S.O., F.R.C.S. (ENG).  
D.T.M. & H.

LIEUT.-COLONEL, I.M.S.,

Consulting Surgeon, Mes. Ex. Force.

#### 1. INFLAMMATORY CONDITIONS DUE TO CALCIFIED REMAINS OF GUINEA-WORMS.

AMONG the more obscure cases which are likely to puzzle newcomers to the Tropics, are various inflammatory processes primarily due to guinea-worm infection. Occasionally the worm dies in the tissues and becomes calcified and gives rise to a train of symptoms, which may deceive even the elect.

The X-Ray plate will usually at once settle the diagnosis, but it may happen that the calcified piece of the worm is situated outside the area radiographed and the condition remains undiagnosed.



It must be remembered that inflammation due to this cause may not appear till months or years after the death of the worm. But, a history of the eruption of other guinea-worms, or even the fact that the patient comes from a part of India where the worm is known to be common, should

always give rise to a suspicion as to the real cause of an unusual inflammatory swelling.

The notes of three cases given below will help those inexperienced in tropical diseases to realize some of the difficulties in diagnosing this condition. The radiograms illustrate amply the X-Ray appearance of the calcified worm; the shadow is convoluted, often fragmented, and the outline is as a rule moniliform.

*Case I.*—A young Madrasí was admitted into hospital complaining of pain in the scrotum. No clear history was available, except that about three months ago he first noticed a thickening at the bottom of the scrotum, associated with slight pain.

There is a firm cord of waxy consistence, about 4" long, lying free in the cellular tissue at the bottom of the left side of the scrotum, outside the tunica vaginalis. The cord has two free ends and has a diameter of a small quill. There is no evidence of inflammation and very little tenderness, and the cord is freely movable in the surrounding areolar tissue. There is also a round elastic mass about  $\frac{1}{3}$ " in diameter, loosely attached above and behind the free cord.

No positive diagnosis was made, but the cord was thought to be the calcified remains of a dead guinea-worm, or the inflammatory remains of filarial infection. A radiogram showed an obvious shadow of a fragmented, moniliform cord, and this was found to be the calcified remains of a guinea-worm, when it was removed by operation. It varies a good deal in individual cases, according to its situation and the age of the calcified deposit.



*Case II.*—A middle-aged Mahomedan was admitted into hospital complaining of pain and swelling of the left knee-joint and thigh. He stated that he had received no injury and that the swelling had gradually appeared. A diagnosis of "Arthritis of the left knee" had been made.

When examined by me, there was no fluid in the knee-joint, and it was evident that the articulation was not directly involved. The swelling occupied the whole of the lower third of the left thigh and was most obvious at the upper part of the popliteal space, where there was tenderness and œdema, but no fluctuation. There was some evening rise of temperature.

A radiogram of the left knee had been taken and a note written on the apparent rarefaction of the ends of the bones forming the joint. (Defect in compact tissue is a common feature in the long bones of many non-muscular types of Indians.) A convoluted shadow at the edge of the plate had not been noticed, and this represented the calcified remains of a dead guinea-worm and was the cause of the inflammation.

With rest and fomentations the inflammatory swelling gradually disappeared and no attempt was made to remove the calcified cord, as the patient was very unwilling to have any operation performed.

*Case III.*—M. A. B., head storekeeper, aged 35 years, a native of Agra, was admitted into hospital for bronchitis. He also complained of a hard lump above the right heel. This occasionally caused him pain.

The patient was infected with guinea-worms during three years' residence in Jodhpur and 21 guinea-worms came out at different times, the first in 1903. All these worms appeared below the knees.

There is a hard, irregular mass just above the heel, involving the tendo achillis. It is flattened from before backwards and has irregular edges projecting beyond the margins of the tendon. There is at present very little pain and no loss of function.

The radiogram shows the very clear outline of a calcified cord, having the characteristic fragmented and moniliform appearance of a calcified guinea-worm. The large calcified mass at the middle of the convoluted cord corresponds to the main body of the tumour, as it is felt clinically.

No attempt was made to remove the calcified cord, as all inflammatory trouble has for the present subsided.

My thanks are due to the officers commanding the hospitals in which these cases were treated, for their courtesy in allowing me to publish these notes.\*

### CEREBROSPINAL FEVER AT GAYA.

By R. HAY PULIPAKA, M.B.; C.M. (EDIN.),

Civil Surgeon.

SINCE the 20th October, 1917, the Gaya Central Jail commenced to receive drafts of undertrial Bakr-id rioters for the Special Tribunal. These prisoners will be known in this note as Special Tribunal cases. They continued to come in batches till on the 30th December, 1917, there were 1,208 prisoners of all classes locked up in a jail of a recognised capacity of 903.

A "B" class three-storied dormitory was set apart for these Special Tribunal cases, and the overflow were accommodated at night in the

downstairs railed verandah of an "A" class three-storied dormitory.

The first case of cerebrospinal fever was at the beginning treated as a case of the typhoid series and the subsequent five as cases of heat stroke, till a lumbar puncture in the seventh case revealed microscopically the diplococci meningitidis intracellulares. The previous diagnosis was accordingly revised.

Up to the time of writing this report there have been 28 cases of cerebrospinal fever in this jail. Of these 28, Tribunal cases numbered 20, and in the other 8 infections could be traced to the Special Tribunal cases. Of the 28 admissions for cerebrospinal fever, 12 were Special Tribunal undertrial prisoners and 8 were Special Tribunal cases that had been convicted.

The following tabular statement furnishes case by case the principal symptoms and complications observed.

Early in March I tried in vain to obtain Flexner's serum in India and in desperation applied to Lieutenant-Colonel Sir Leonard Rogers, who with characteristic courtesy not only sent me some Flexner's serum which he had in stock but advised me to write to Captain R. Knowles, Director of the King Edward VII Memorial Pasteur Institute, Shillong, who had an anti-meningococcus vaccine. Captain Knowles responded promptly, and the first injection of anti-meningococcus vaccine was made on the 2nd April, 1918. In the remarks column of the tabular statement I have noted the number of vaccine injection received by cases. The minimum number of injections that were required to effect a cure was 5. The average number of injection was 8 or 9. One case needed 16.

The treatment by Captain Knowles' vaccine was subcutaneous.

(A) For cases: initial dose 1 c.c. equals to 300 million; 3rd day 450 million or  $1\frac{1}{2}$  c.c.; 6th day 600 million or 2 c.c., above which dose I did not go.

(B) For contacts: one dose of 300 million or 1 c.c. was given on 8th April, 1898, on which date there were 56 undertrial prisoners in the undertrial ward. Of these half, or 28, were given 1 c.c., the other half being left as a control. Of the prophylactically inoculated one only contracted cerebrospinal fever, on 22nd April, 1918, and was released, cured, on 6th May, 1918.

None of the uninoculated were attacked.

The experiment was not repeated.

Reaction after injection of Captain Knowles' vaccine was nil in some cases. In others a slight rise of temperature followed. The maximum rise was two degrees higher than the previously existing temperature.

The vaccine I have found useless as a prophylactic, but certainly effective as a therapeutic agent. It is of no use in fulminating cases.

\* Two photos received spoiled. One we reproduce.—ED., I. M. G.

*A Tabular Statement of the Principal Signs, S*

| No.                            | NAME.                 | Age. | Class of prisoner. | Date of admission in jail. | Date of admission in hospital. | Retention of urine. | Albuminuria. | Hæmaturia. | Headache. | Restlessness. | Rigidity and pain in neck and spine. | Kernig's sign. | Drowsiness. | Unconsciousness. | Leucocytosis. |
|--------------------------------|-----------------------|------|--------------------|----------------------------|--------------------------------|---------------------|--------------|------------|-----------|---------------|--------------------------------------|----------------|-------------|------------------|---------------|
| <i>Jail.</i>                   |                       |      |                    |                            |                                |                     |              |            |           |               |                                      |                |             |                  |               |
| 1                              | Ram Prasad ...        | 23   | C. (st.)           | 22-11-17                   | 9-2-18                         | 1                   | 1            | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| 2                              | Gokhul Chamar ...     | 56   | U. T. (st.)        | 9-12-17                    | 26-2-18                        | ...                 | ...          | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | 1             |
| 3                              | Bisambhar Chamar ...  | 33   | U. T. (st.)        | 20-10-17                   | 2-3-18                         | ...                 | ...          | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| 4                              | Sukh Lall Kumar ...   | 38   | U. T. (st.)        | 20-10-17                   | 2-3-18                         | ...                 | 1            | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| 5                              | Surit Singh ...       | 46   | U. T. (st.)        | 24-1-18                    | 2-3-18                         | ...                 | 1            | ...        | ...       | 1             | 1                                    | ...            | 1           | ...              | ...           |
| 6                              | Jhumak Ahir ...       | 25   | U. T. (st.)        | 24-1-18                    | 2-3-18                         | ...                 | 1            | ...        | ...       | 1             | 1                                    | ...            | 1           | ...              | ...           |
| 7                              | Rameshy Gowala ...    | 40   | U. T. (st.)        | 31-10-17                   | 3-3-18                         | ...                 | ...          | ...        | ...       | 1             | 1                                    | ...            | 1           | ...              | ...           |
| *8                             | Sukhan Ahir ...       | 55   | U. T. (st.)        | 20-10-17                   | 5-3-18                         | ...                 | 1            | 1          | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| 9                              | Anath Dusadh ...      | 55   | U. T. (st.)        | 17-11-17                   | 4-3-18                         | ...                 | ...          | ...        | 1         | ...           | 1                                    | ...            | 1           | ...              | ...           |
| 10                             | Bansi Singh ...       | 55   | U. T. (st.)        | 17-11-17                   | 4-3-18                         | ...                 | ...          | ...        | ...       | ...           | ...                                  | ...            | ...         | 1                | ...           |
| 11                             | Jiorakhan Singh ...   | 28   | U. T. (st.)        | 7-1-18                     | 7-3-18                         | ...                 | ...          | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| *12                            | Khubhari Bania ...    | 50   | C.                 | 30-6-17                    | 12-3-18                        | ...                 | ...          | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| 13                             | Bharat Singh ...      | 58   | C. (st.)           | 20-10-17                   | 3-2-18                         | ...                 | 1            | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| 14                             | Bilati Gode ...       | 23   | C.                 | 2-3-18                     | 14-3-18                        | ...                 | 1            | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| *15                            | Dalbhan Singh ...     | 43   | C. (st.)           | 27-11-17                   | 17-3-18                        | ...                 | ...          | 1          | ...       | 1             | 1                                    | ...            | 1           | ...              | 1             |
| 16                             | Goberdhan Kurmi ...   | 65   | C. (st.)           | 13-11-17                   | 22-3-18                        | ...                 | ...          | ...        | ...       | 1             | 1                                    | ...            | ...         | 1                | ...           |
| 17                             | Tilakdhari Mahton ... | 45   | C.                 | 25-2-16                    | 23-3-18                        | ...                 | ...          | ...        | ...       | 1             | 1                                    | ...            | ...         | 1                | ...           |
| *18                            | Ramgulam Singh ...    | 41   | C. (st.)           | 27-11-17                   | 23-3-18                        | ...                 | ...          | ...        | ...       | ...           | 1                                    | ...            | ...         | ...              | 1             |
| *19                            | Akhaj Singh ...       | 36   | C. (st.)           | 17-11-17                   | 2-4-18                         | ...                 | 1            | 1          | ...       | ...           | 1                                    | ...            | ...         | ...              | ...           |
| *20                            | Birkeshwar Singh ...  | 28   | C.                 | 12-11-17                   | 9-4-18                         | ...                 | ...          | ...        | 1         | ...           | ...                                  | ...            | ...         | ...              | ...           |
| *21                            | Bulak Jeswar ...      | 60   | C. (st.)           | 3-4-18                     | 10-4-18                        | ...                 | 1            | ...        | ...       | ...           | 1                                    | ...            | 1           | ...              | ...           |
| *22                            | Rukhani Dusadh ...    | 45   | C.                 | 18-12-17                   | 16-4-18                        | ...                 | ...          | ...        | ...       | ...           | 1                                    | ...            | ...         | ...              | ...           |
| *23                            | Fakir Chand ...       | 46   | U. T. (st.)        | 5-4-18                     | 22-4-18                        | 1                   | 1            | ...        | 1         | ...           | 1                                    | ...            | ...         | ...              | 1             |
| *24                            | Karoo Singh ...       | 38   | C.                 | 21-2-17                    | 29-4-18                        | ...                 | ...          | 1          | ...       | ...           | 1                                    | ...            | 1           | 1                | 1             |
| *25                            | Kisben Chand ...      | 30   | C. (st.)           | 13-11-17                   | 23-4-18                        | ...                 | ...          | 1          | ...       | ...           | 1                                    | ...            | ...         | ...              | 1             |
| *26                            | Nirsa Dhunia ...      | 35   | C.                 | 16-10-17                   | 3-5-18                         | 1                   | 1            | ...        | ...       | ...           | ...                                  | 1              | ...         | 1                | ...           |
| *27                            | Raghunandan Singh ... | 36   | U. T. (st.)        | 8-5-18                     | 6-5-18                         | 1                   | ...          | 1          | 1         | 1             | 1                                    | ...            | 1           | 1                | 1             |
| *28                            | Bajo Singh ...        | 50   | C.                 | 15-6-18                    | 20-6-18                        | ...                 | 1            | ...        | ...       | ...           | ...                                  | ...            | 1           | 1                | 1             |
| <i>Police Hospital.</i>        |                       |      |                    |                            |                                |                     |              |            |           |               |                                      |                |             |                  |               |
| *1                             | Jan Mahamud ...       | 81   | ...                | ...                        | 2-5-18                         | ...                 | ...          | ...        | 1         | ...           | ...                                  | ...            | ...         | ...              | 1             |
| *2                             | Abdur Rahman ...      | 25   | ...                | ...                        | 21-5-18                        | ...                 | ...          | ...        | 1         | ...           | ...                                  | 1              | ...         | ...              | ...           |
| <i>Labour Recruiting Camp.</i> |                       |      |                    |                            |                                |                     |              |            |           |               |                                      |                |             |                  |               |
| *1                             | Nesar Ali ...         | 24   | ...                | ...                        | 17-3-18                        | ...                 | ...          | ...        | 1         | ...           | 1                                    | ...            | ...         | ...              | ...           |
| *2                             | Malai Bapari ...      | 25   | ...                | ...                        | 11-5-18                        | ...                 | ...          | ...        | 1         | ...           | ...                                  | 1              | ...         | 1                | ...           |
| *3                             | Jumi Lal ...          | 30   | ...                | ...                        | 30-5-18                        | ...                 | 1            | 1          | ...       | ...           | ...                                  | 1              | ...         | ...              | ...           |
| <i>Pilgrim Hospital.</i>       |                       |      |                    |                            |                                |                     |              |            |           |               |                                      |                |             |                  |               |
| 1                              | Bishun ...            | 30   | ...                | ...                        | 22-5-18                        | ...                 | ...          | ...        | ...       | ...           | 1                                    | 1              | ...         | 1                | ...           |
| 34 cases.                      | Total                 | ...  | ...                | ...                        | ...                            | 4                   | 12           | 7          | 8         | 5             | 24                                   | 16             | 13          | 12               | 16            |

C = Convict.

st. = Bakr-id Riot Cases.



Captain Knowles tells me his vaccine was prepared from meningococcus strain isolated from two cases of cerebrospinal fever at Gauhati.

I subjoin statements classifying the cases according to the type of the disease, according to age and sex, and according to the month in which they were attacked.

*Prophylaxis.*—As a prophylactic measure all contacts had their oronasal cavities daily sprayed with a weak solution of potassium permanganate in normal saline.

*Principal post-mortem signs:*—

The brain was congested, some cases intensely so, with distended veins standing out prominently.

*Classification according to the Type of Disease.*

|             | FULMINATING.           |                        |                      |                      |        | ACUTE.               |                       |                       |                       |            |            | SUB-ACUTE. |                       |                      |        |
|-------------|------------------------|------------------------|----------------------|----------------------|--------|----------------------|-----------------------|-----------------------|-----------------------|------------|------------|------------|-----------------------|----------------------|--------|
|             | Death within 12 hours. | Death within 24 hours. | Death within 2 days. | Death within 4 days. | Total. | Death within 1 week. | Death within 2 weeks. | Death within 3 weeks. | Death within 4 weeks. | Recovered. | Not known. | Total.     | Death within 2 weeks. | Death after a month. | Total. |
| Jail ...    | 3                      | 2                      | 2                    | 1                    | 8      | 2                    | 3                     | 1                     | 1                     | 10         | 1          | 13         | 1                     | 1                    | 2      |
| Outside ... | 1                      | ...                    | ...                  | ...                  | 1      | 1                    | ...                   | ...                   | ...                   | 3          | 1          | 5          | ...                   | ...                  | ...    |
| Total ...   | 4                      | 2                      | 2                    | 1                    | 9      | 3                    | 3                     | 1                     | 1                     | 13         | 2          | 23         | 1                     | 1                    | 34     |

*Classification according to Age and Sex.*

|             | SEX.  |         | AGE.            |                 |                 |                 |                 |
|-------------|-------|---------|-----------------|-----------------|-----------------|-----------------|-----------------|
|             | Male. | Female. | Under 20 years. | 20 to 30 years. | 30 to 40 years. | 40 to 50 years. | Above 50 years. |
| Jail ...    | 28    | ...     | ...             | 5               | 8               | 8               | 7               |
| Outside ... | 6     | ...     | ...             | 5               | 1               | ...             | ...             |
| Total ...   | 34    | ...     | ...             | 10              | 9               | 8               | 7               |

| Month.       | NUMBER OF CASES. |                         |                  |                   | Total. |
|--------------|------------------|-------------------------|------------------|-------------------|--------|
|              | Jail.            | Labour Recruiting Camp. | Police Hospital. | Pilgrim Hospital. |        |
| February ... | 2                | ...                     | ...              | ...               | 2      |
| March ...    | 16               | 1                       | ...              | ...               | 17     |
| April ...    | 6                | ...                     | ...              | ...               | 6      |
| May ...      | 3                | 2                       | ...              | ...               | 5      |
| June ...     | 1                | ...                     | ...              | ...               | 1      |
| Total ...    | 28               | 3                       | 2                | 1                 | 34     |

The following statement furnishes details as to the case incidence, and end results without vaccine treatment and after vaccine treatment.

|             | Number affected. | TREATED BY VACCINE. |       |            |        | NOT TREATED BY VACCINE. |       |            |        |
|-------------|------------------|---------------------|-------|------------|--------|-------------------------|-------|------------|--------|
|             |                  | Cured.              | Died. | Not known. | Total. | Cured.                  | Died. | Not known. | Total. |
| Jail ...    | 28               | 9                   | 5     | ...        | 14     | 1                       | 12    | 1          | 14     |
| Outside ... | 6                | 3                   | 1     | ...        | 5      | ...                     | ...   | ...        | ...    |
| Total ...   | 34               | 12                  | 6     | 1          | 19     | 1                       | 13    | 1          | 15     |

The convexity of the brain was smeared with a fibrinopurulent of fibrinoplastic exudate running between and over the sulci. The base of the brain, the medulla and pons were often coated with thick pus. In some cases a circumscribed area of tissue destruction with abscess formation was found. Punctiform extravasation of blood was found in the white matter. Occasionally a large amount of cerebrospinal fluid poured from the brain on removing the membranes.

The other organs were congested, especially the kidneys, from which blood often dripped on section.

I am indebted to Sub-Assistant Surgeon Zafar Hasan for the keen clinical interest he has taken in these cases generally and for assistance in compiling this note.

**A CASE OF POST-OPERATIVE TETANUS.**

By KANTA PRASAD,

LIEUT.-COLONEL, I.M.S.

ALTHOUGH tetanus bacilli or their spores are so widely distributed as to be almost ubiquitous and are said to be especially numerous in the dust of roads, in garden, and in horse and cattle manures, yet tetanus is a disease of comparative rarity in civil surgical practice. I was, therefore, very much surprised when the following case of mine developed generalised tetanus five days after an operation for hæmorrhoids and died within three days of the infection.

A Burman, male, aged 40 years, was undergoing a sentence of 5 years' rigorous imprisonment in the Central Jail under my charge, and was to have been released the coming May. He was a steady man, and as a result of his good work had become a convict Overseer and was attached to the jail hospital. While there, he had seen many operations done successfully for the radical treatment of internal piles, and as he himself was troubled with them he decided to have himself put right before leaving. He was, therefore,



admitted to hospital on 29th March and operated on the next morning. There was nothing special about the operation. It was done by simple ligaturing. There were three piles, an incision was made round the base of each of them and after transfixing, sterilized silk ligature was put in. Up to 4th April his condition remained good and he complained of nothing in particular. His bowels had moved spontaneously on 3rd as well as 4th April. There was no septic discharge from the piles. The man was cheerful and happy. Temperature remained normal all along. On the morning of the 5th April he complained of slight pain in the lower jaw and difficulty in swallowing. There was still no fever, tongue was clean and bowels had moved as usual. A dose of bromide was given. By the evening lockjaw became well marked and the mouth could hardly be opened. In the effort to protrude the tongue his facial muscles produced "risus sardonicus." His neck became stiff and there was increased flow of saliva from the mouth. As he was unable to swallow anything, he had to be fed through nasal tubes. There was marked retention of urine, which had to be drawn by a soft catheter. Next day, in spite of bromides, chloral, and injections of morphia and antitetanic serum, his condition became decidedly worse. All the abdominal, respiratory and back muscles were in a state of spasm. There was urgent dyspnoea, the patient very restless, and his face flushed and bathed with clammy perspiration. In this state he lingered for another 24 hours and, next day, died of asphyxia and sheer exhaustion. Throughout the attack his senses and consciousness remained absolutely normal and forearms and hands were not affected at all.

How this man got the infection is a puzzle to me. There has never been a case of tetanus in the jail before. There are always about a dozen surgical cases under treatment in the jail hospital and conditions with them are exactly the same as they were with the deceased; operations for radical cure of hæmorrhoids are performed nearly every week, and this infection was unknown up till now. How to prevent such sporadic cases in future seems to me a still more difficult question, as every possible precaution is always taken against septicism. Ligatures and instruments are systematically sterilized before an operation is undertaken, and the fact that all the previous piles operation cases have invariably resulted in recovery goes to show that attempts towards aseptic surgery have been fairly successful. Once the infection is set in there seems to be no cure. Sedative drugs have no effect, and even the curative value of antitetanic serum seems to be doubtful in a generalized form of tetanus. Early premonitory symptoms are so few and uncertain that they require a very careful eye to observe and avoid delay in the use of the specific serum.

Whether this case was idiopathic or had some tetanic bacilli in his gut is difficult to say.

### A CASE OF ECTOPIC GESTATION BURST INTO THE RECTUM (4 TO 5 MONTHS).

By DR. T. C. CHATTERJEE,

Late House Surgeon, Eden Hospital.

*Date.*—April 1st.

*Name.*—Wife of B. P. H., of Diamond Harbour.

*Preg.*—Mother of 3 children, last child 8 years old.

*Examination.*—On April 1st, 1917:—

*Abdomen.*—A tumour about the size of a 6-month pregnant uterus, and very hard and tender. Cannot be moved.

*Pelvic Viscera.*—Open one finger; on passing the finger a lump is felt in the uterus, soft and felt like a portion of ovum retained in the uterus. The uterus cannot be moved, and cavity cannot be made out definitely; and tender at every part. The patient is in extreme pain, cannot lie in bed, cannot sit, groaning as if she is in extreme agony. There is a blood discharge.

On asking for the history, the husband told me that she was 4 to 5 months pregnant, and all came out about a week before. Since the abortion she is suffering and going from bad to worse.

*Clinical Diagnosis.*—(i) Incomplete abortion, with decomposition of the remainder of the ovum and consequent parametritis, etc.?

(ii) A case of fibroid with pregnancy and subsequent decomposition of the remainder of the ovum?

They are ordinary low-class people and illiterate, so no satisfactory history could be had.

*Treatment.*—Under CHCl<sub>3</sub> the uterus was explored and bits of decidua tissue scraped out with a blunt flushing curette; and the uterus felt like a fixed subinvolved one. No reduction of the size after the emptying of its contents. Small bits of something like decidua tissue and chorionic villi were also removed, by a small ovum forceps.

The patient felt well after the operation, with complete disappearance of the pain; on the night of the day of operation, she developed symptoms of diffuse peritonitis with a temperature 104°, pulse 140, respiration 25 to 30 per minute.

The tympanitis, hiccough, temperature, all disappeared—with a long-tube enema with 2 ounces of turpentine and 2 ounces of castor oil—but the pulse and temperature remained the same till next morning. She remained better till the evening of the next day, when distension, flatulence, etc., and all the symptoms of peritonitis again developed and remained for 5 to 6 hours, but subsided again after a long-tube enema.

Pulse rate remained the same, and the temperature varied from 101.5° to 104° for two days. The patient started to pass mucus and blood, just like a case of acute dysentery. On the 15th day after operation she complained as if something was obstructing the rectum and that she was feeling uncomfortable. The usual rectal saline was continued every 4 hours. On the 20th day she passed good solid stools and a piece of bony substance was found with the motion. On washing it out it was found to be a piece of small bone, and how it came could not be made out; all other stools were washed since then and every time small bits were found and collected. It was finally found to be the bones of a small fetus, as can be seen from the specimen.

The bones were collected as many as could be found in the stools:

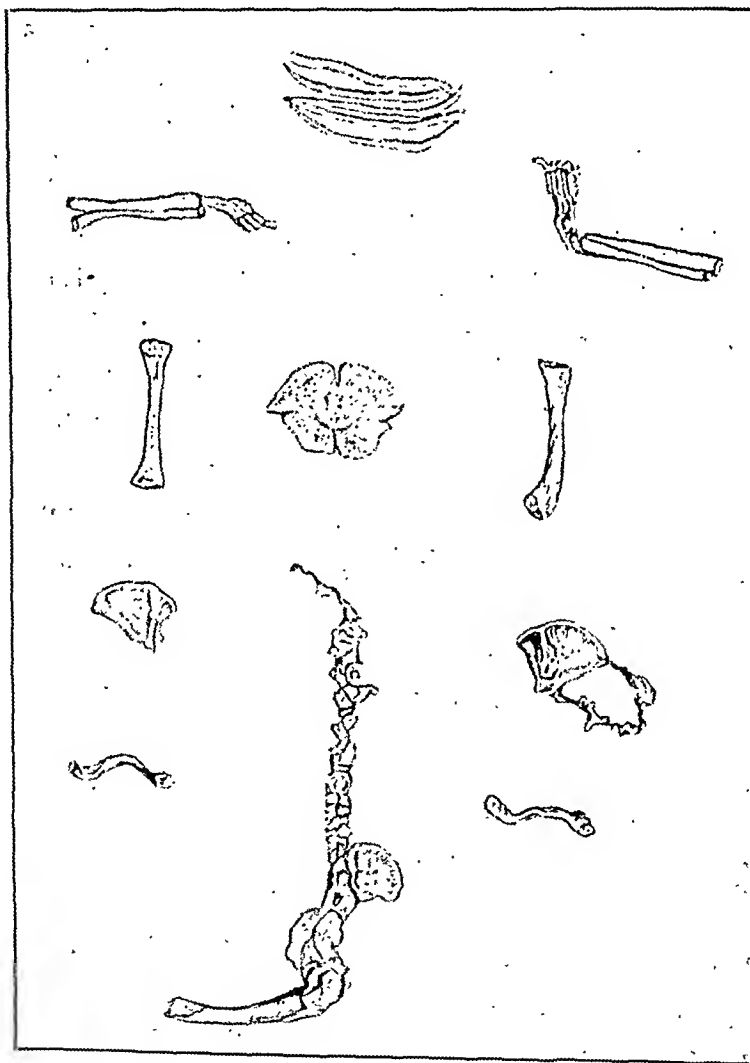
The tumour in the abdomen gradually subsided, and the patient left for her home, with all the symptoms disappeared, in a month's time.

There was history of gonorrhoea in the husband as well as the wife.

# A CASE OF ECTOPIC GESTATION BURST INTO THE RECTUM (4 TO 5 MONTHS).

BY DR. T. C. CHATTERJEE,

*Late House Surgeon, Eden Hospital.*



Some of the bones passed per rectum in the case of ectopic gestation.



Antipyrin, Phenacetin, and Pyramidon  
superseded.

## CRYOGENINE

LUMIÈRE.

**NON-TOXIC : EFFICACIOUS : HARMLESS**

Adopted by the French Ministries for War and the Navy, also by the Poor Relief Board. Papers on "Cryogenine" have been read before various Medical Societies by over 90 of the most eminent Continental Medical Men. In each paper clinical results of the most satisfactory character are recorded. "Cryogenine" is a white crystalline powder, odourless and almost tasteless; its chemical composition is Metabenzamido semi-carbazide.

Cryogenine has a high reputation as a

**GENERAL ANTIPYRETIC and POWERFUL ANALGESIC.**

FORMS.—Tablets, Pills and Powder.

LANCET, Dec. 18th, 1909, p. 1812: "..... The above case is one out of a number of successful results obtained from the use of this remedy (Cryogenine) contrasted with Pyramidon, which certain writers regard as the best drug for phthisical temperature. I think there can be little doubt 'Cryogenine' is the safer and more efficacious antipyretic. ...."

J. E. G. ———, M.D.

BURNS  
VARICOSE  
ULCERS  
RHEUMATISM  
NEURITIS

## AMBRINE

(The only Authorised Preparation of Dr. Barthe de Sandfort.  
Various Imitations compel us to make this statement.)

GOUT  
NEURALGIA  
CHILBLAINS  
SCIATICA

**AMBRINE instantly alleviates pain, promotes rapid healing, forms a sure Protection against Infection of the Wound.**

Although the dressing with AMBRINE is occlusive and adhesive, it becomes after a short period non-adhesive, and can be removed without pain, hæmorrhage, or injury to the newly forming tissues. The healing takes place without leaving scars or contraction.

May be applied with a camel's-hair brush, but our specially designed spray greatly facilitates the application.

THE BRITISH MEDICAL  
JOURNAL,  
Sept 2nd, 1916:—

Re AMBRINE TREATMENT.

"..... The primary and quite incontestable advantages of the treatment are two: it is agreeable to the patient, because entirely painless; it is convenient to the surgeon, because easily and quickly applied. .... It is possible that the treatment would be useful in dealing with ordinary ulcers, and in any case it is certain that the study of its application to the raw surfaces is worth pursuing. ...."

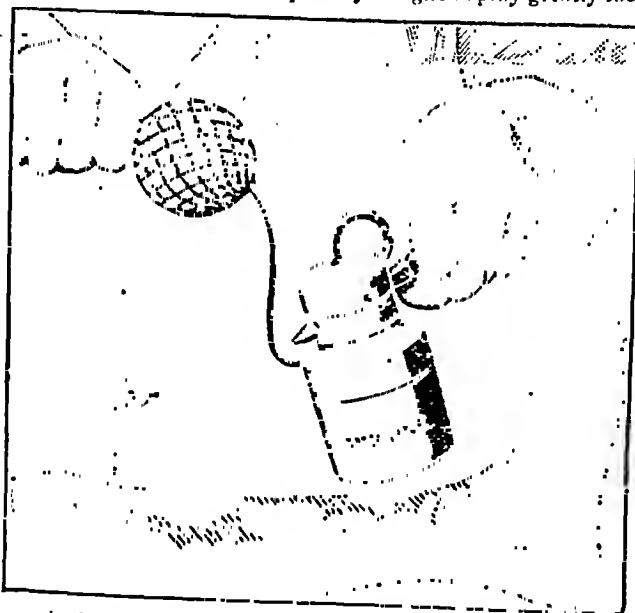
26/10/17.

E—.

DEAR SIR,—I thank you for the Ambrine. I found it very effective in a chronic and very painful varicose ulceration of leg.

Please send some more Ambrine, about 5s. worth.

A.G.W., M.R.C.S., L.R.C.P., &c.



THE LANCET,  
June 10th, 1916:—

THE VALUE OF AMBRINE  
IN THE  
TREATMENT OF WOUNDS.

"Attention is being drawn to the remarkable success of the Ambrine Wax treatment now being used at the Hôpital St Nicolas at Issy-les-Moulineux for burns, frozen feet, and all wounds where the tissues have been so damaged as to exact great length of time and considerable disfigurement in their rectification by the usual means. The Minister of War, in reply to the Deputy M. Monsie, as to why, in view of the marvellous results obtained by treating burns and frost bites with Ambrine at the Hôpital St. Nicolas, all the soldiers suffering from such wounds were not sent there, stated that this was being done as far as possible. ...."

The most efficient means and method of ensuring active **Hyperthermal-Therapy** to the practical treatment of **Burns and Varicose Ulcer, Rheumatism, Gout, Arthritis, Neuralgia, and similar affections.**

LITERATURE and CLINICAL REPORTS on REQUEST.

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P. O. Box 216, Calcutta.

P. O. Box 303, Bombay.

P. O. Box 226, Madras, or from

**THE ANGLO-FRENCH DRUG CO., LTD.**

(Late M. BRESILLON & Co.),

Phone: HOLBORN, 1311.

Game Building, Holborn, London, E.C. 1. Telegrams: "AMPALYAE, LONDON."

# NEOCAINE-SURRENINE

Neocaine is a synthetic product of French manufacture.

A Perfect **COCAINE SUBSTITUTE** of Low Toxicity.

A White Powder, readily soluble in water. Analgesic power, duration, and rapidity of action quite equal to Cocaine.

Toxicity less than one-sixth.

Therapeutical effects identical with Cocaine (excepting as an exhilarant) for Dental or Surgical, local and Spinal Anæsthesia, Lozenges, Snuffs, Ointments, &c.

## Composition of Neocaine-Surrenine:

|                                     |     |     |          |
|-------------------------------------|-----|-----|----------|
| Pure Neocaine                       | ... | ... | 5 c.g.   |
| Acid Borate of Adrenalin (Takamine) | ..  | ... | 0.1 m.g. |

Pure Neocaine is also supplied.

FORMS.—Powder in capsules and phials. Ready prepared solutions in Ampoules (various percentages), and Ampoules of sterilised liquid for making solutions.

## THE MEDICAL TREATMENT OF CANCER.

# CUPRASE

CUPRASE is a colloidal copper hydroxide which is obtained chemically by the reduction of salts of copper in the presence of albuminous acid.

As a result of over ten years' research work on Cancer, Dr. Gaube du Gers produced a new Colloidal Copper Hydroxide which has given remarkable results in *arresting the progress of the disease*, with loss of pain, and great improvement in the general condition of the patient.

The numerous clinical reports from Doctors of repute in various countries, give cases of a great variety. In all of these pain has been eliminated, and in a Good percentage of cures are claimed, and in no instance any undesirable effects.

Its easy application (intramuscular injections) places it within the reach of all practitioners. It is not toxic.

Disappearance of the Pain.

Return of Sleep.

Increase of Appetite.

Colour and Strength.

Supplied in boxes of 8 ampoules.

WARWICKSHIRE, July 1st, 1917.

DEAR SIRS,—Will you please send me another box of Cuprase ampoules. The previous lot effected a most remarkable cure in an elderly lady suffering from cervical cancer—the cauliflower-like growth has disappeared with its offensive discharge.

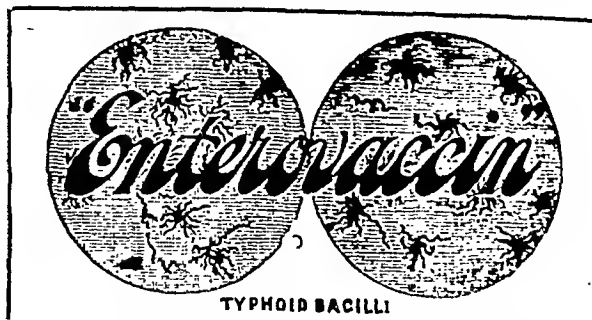
This case was given three months' life by a Specialist, being inoperable.

Yours faithfully,

(Signed) B—B—, M.R.C.S., L.R.C.P.

## ANTITYPHOID

Inoculation by the gastro-intestinal tract



The results of **4,000** applications of **Enterovaccin** carried out by approximately 200 Doctors are as follows:

1. **No one** who has been treated with **Enterovaccin** has been attacked by typhoid fever.
2. This method of immunisation is without risk.
3. There is no contra-indication.

Enterovaccin is put up in hermetically sealed tins containing 28 spherules, sufficient for a complete treatment (one week). Each spherule contains per milligramme: 300 millions Eberth bacilli. 180 millions coli bacilli. 120 millions paratyphoid bacilli.

# IODEOL

Perfectly tolerated. Never causes Iodism.

Each capsule contains 4 grains of Colloidal Iodine in the most minute form of subdivision known.

It is administered by  
**INTRAMUSCULAR INJECTION**

for

**Pneumococcal Disease**  
—Simple and Infective  
and

**Broncho-Pneumonia**

**Bronchitis**

**Pulmonary Congestion**  
**TUBERCULOSIS, &c.**

**By the Mouth (Capsules):**

**Syphilis**, or wherever Iodides are indicated. **Iodeol** is ten times more active and does not cause Iodism.

**Externally (Liquid):**

Contains 50 per cent. Colloidal Iodine (must not be used for injection), ten times more active than painting with Iodine tincture—does not produce erythema or irritation. Absorption is extremely rapid.

**For Gynaecology (Ovules):**

These are introduced into the vagina, slowly discharge the iodine which penetrates deeply into the vaginal mucous membrane, giving rapid relief from congestion and pain.

Destructive to the micro-organisms.

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Gamage Building, Holborn, London, E.C. 1. Telegrams: "ANGFRAVAS, LONDON."

Phone: HOLBORN, 1311.



Recurrent Fever  
SYPHILIS

# GALYL

Framboesia and  
Sleeping Sickness

Practical work with GALYL in the shape of

**60,000 INTRAVENOUS** (Dilute and Concentrated) and **INTRAMUSCULAR INJECTIONS** administered in Military, Naval and the principal General Hospitals throughout the United Kingdom, has demonstrated that this preparation is **more rapid and less toxic** in action than any compound of the "606" group, which accounts for the **consistently excellent clinical results without any undesirable by-effects.**

## Forms:

FOR INTRAVENOUS INJECTIONS:—

(1) **DILUTE.**—GALYL is supplied in neutral glass ampoules containing the necessary dose of Sodium Carbonate, sterile distilled water only being used for the dissolution.

(2) **CONCENTRATED.**—A special outfit containing one dose GALYL, one ampoule sterilised solution, and one small filter is supplied.

### Doses:

0.10—0.15—0.20—0.25—0.30—0.35—0.40

(3) FOR INTRAMUSCULAR INJECTIONS:—  
GALYL is supplied in **OILY EMULSION.**

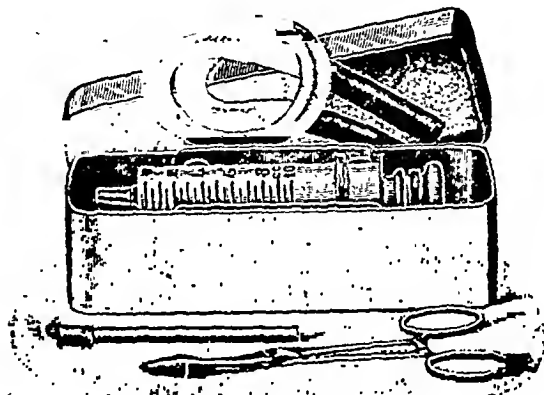
### Doses:

0.10—0.15—0.20—0.30—0.40.

## POCKET CASE.

Containing the entire instruments (sterilizable) necessary for administering a concentrated intravenous injection of GALYL or other solution.

- 1 India-rubber Tube for constricting the arm.
- 1 Clamp for fixing the rubber band.
- 1 Glass Syringe of 10 c.c. capacity.



- 1 Platinum-iridium Needle, length 4 cm., diameter 0.9, with short bevelled joint and special barrel. Attachable to the syringe without any additional junction.
- 1 Nickel-plated Case to hold all the above.
- 1 Chamois Leather Pouch.
- 1 Glass Filtering Tube, with rubber attachment.

Price complete 30/-

## HECTINE

**Formula:** Sodil Benzo-sulpho-p-amniaphenyl arsonas.

Dr. Mouneyrat—the discoverer of Galyl (the well-known and widely adopted French Neo-Salvarsan substitute) and also Hectine, a compound which—though it possesses a very low arsenic percentage and has proved most safe in use—gives remarkably successful clinical results in syphilis and the parasyphilitic affections. Hectine has a record of about one million injections.

Hectine is not only a specific in syphilis, but it acts as a general tonic in the treatment of bloodless and anæmic patients and in all cases where **Arsenic** is indicated.

In malaria it acts as a specific owing to its anti-parasitoid and anti-thermic actions; also in tuberculosis, rachitism, neurasthenia, asthma, chorea, skin diseases, etc., etc.

**Hectine** is supplied in hermetically sealed ampoules for intramuscular injections.

Ampoules A—containing 10 c.g. in 1 c.c.

Ampoules B—containing 20 c.g. in 1 c.c.

Pills (in phials of 24) 10 c.g.

## HECTARGYRE

(Mercurial Salt of Hectine)

Hectargyre being a **double specific** cures syphilis and all its manifestations more rapidly and more surely than any other mercurial preparation.

As a treatment following Galyl, or *ab initio* in all stages of the disease, Hectargyre is very effective and rapid; it is well tolerated even where prolonged treatment is necessary; the most intractable cases of syphilis have yielded highly satisfactory results.

Hectargyre is supplied in sterile ampoules for intramuscular injections.

Ampoules A containing—

Hectine 10 c.g. }  
Hg. 1 c.g. } in 1 c.c.

Ampoules B containing—

Hectine 20 c.g. }  
Hg. 1½ c.g. } in 1 c.c.

Pills containing—

Hectine 10 c.g.  
Protoid of Hg. 1 c.g.  
Opium Extract 1 c.g.  
(In phials of 24 pills.)

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Telegrams: "AMPSALVAS, LONDON."

## The Combined Treatment of SYPHILIS.

## SUPSALVS

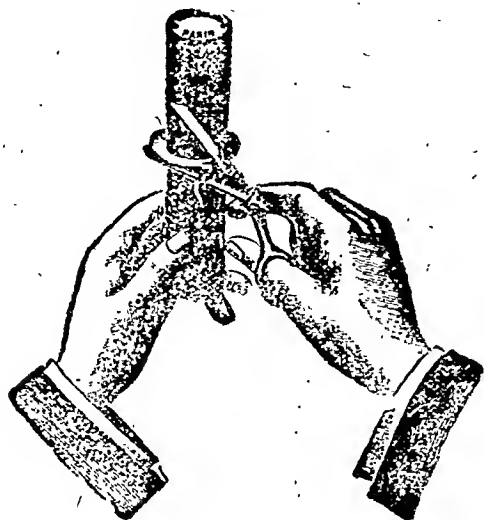
STABLE SUPPOSITORIES OF  
"606" (of French Manufacture)

FIG. 1.

Fig. 1 represents the special patent metallic envelope containing a Supsalv for hot climates. The projecting edge in the middle is cut by scissors—the two ends are then easily pulled apart. The envelope should first be immersed in cool or iced water for 10 minutes.

At the International Congress of Medicine Ehrlich stated that the biochemical action of "606" on spirochaetes is not direct but indirect, a third factor found in the body fluids being necessary.

This success is explained by the well known experiment of Lovaditi: "If living treponemas be placed in a solution of Arsenobenzol (Ehrlich's 606) they continue to live in it. But if a trace of extract of liver be added to the mixture the treponemas are destroyed."

"If 606 has to be taken up and transformed by the liver in order to become toxic to the treponema, there is no better mode of absorption of the drug than by way of the intestine, since all the veins of the intestines join the portal vein. If this be the case no route could be more indirect and more unsatisfactory for active treatment than one that is not intestinal or not intravenous (i.e., prehepatic), since some of the drug must necessarily become fixed everywhere before the passage through the liver has activated it."—Dr. Sahouraud, La Clinique (13-4 1913).

As a result of numerous clinical experiments, Dr. Bagrov, of Moscow, has arrived at the same conclusion, and recommends the rectal method of administration of 606.

200 cases were treated by the combined treatment in one of the London hospitals. In each case a negative reaction was attained.

Extremely Simple in  
Use.

No Ill-effects.

Most Satisfactory  
Clinical Results.

Rapid Absorption.

## MERSALV

FOR MERCURIAL INUNCTION IN  
CONNECTION WITH SUPSALVS  
TREATMENT.

**CHEMISTRY.**—"Mersalv" contains 10 per cent. metallic mercury, which by a special mechanical process exists in the minutest state of sub-division possible. It is a non-greasy preparation, and, in contra-distinction to other mercurial preparations, contains no organic fats or oils. "Mersalv" is of a white creamy consistence, of pleasant odour, and cleanly in application.

In Special Glass Stoppered Bottles for Hot Climates.

## IODOGÉNOL

IODINE in its Most Reliable and Palatable Form.

IODOGÉNOL is a preparation containing Iodine in an organic, assimilable and one might almost say "living" form.

IODOGÉNOL possesses about 38 times the physiological activity of that of iodide of potassium, this preparation has, according to the clinical reports of eminent professors, succeeded where the usual iodide treatment had failed after producing undesirable by-effects.

IODOGÉNOL does not produce Iodism or other bad symptoms.

IODOGÉNOL is an undoubted digestive stimulant and promotes appetite and has a markedly beneficial effect on the general nutrition. It has been tried in many of the large hospitals, and given highly satisfactory clinical results in cases of

Syphilis, Rheumatism, the various phases of Tuberculosis, General Debility, etc.

20 minims of IODOGÉNOL are equivalent to 8 grs. Iodide Potassium.

The SCIENTIFIC TREATMENT OF MALARIA  
INFLUENZA AND ALLIED AILMENTS.

## KINECTINE

According to Dr. MOUNEYRAT, the discoverer of Galy and Hectine (the widely adopted Salvarsan Substitutes).

## FORMULA:

Chlorhydrate of Quinine c. Hectine—i.e., Benzo sulfone-para-amino-phenyl-arsenate of Quinine.

Non-toxic, produces no ill-results.

Easily taken (tablets) and well tolerated.

Highly satisfactory clinical results.

Not only a Prophylactic against, but a Specific in, INFLUENZA, Catarrh, Coryza, Hay Fever, Malaria, etc.

H.M.S. —, 27.7.17.

SIR,—I enclose P.O. for the tube of Kinectine. The drug has given every satisfaction.

W. B. H. W., Surgeon, R.N.

The Anglo-French Drug Co., Ltd., Holborn, London, E.C.

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Phone: HOLBORN, 1811.

## Indian Medical Gazette.

AUGUST.

## MEDICAL STUDENTS AND MEDICAL SCHOOLS IN INDIA.

THE great need of enlarging and increasing the accommodation in the Medical Schools and Colleges is now generally recognised, and after the war money will have to be diverted to this object.

The report of the Sanitary Commissioner with the Government of India gives the following figures of the students attending the various Schools and Colleges :—

*Medical Colleges.*

Students, Females.

|  |     |     |    |
|--|-----|-----|----|
| Grant Medical College, Bombay          | ... | 705 | 52 |
| Madras Medical College                 | ... | 448 | 32 |
| Lahore Medical College                 | ... | 232 | 7  |
| Calcutta Medical College               | ... | 965 | 19 |
| King George's Medical College, Lucknow | ... | 141 | 5  |

*Medical Schools.*

Students, Females.

|                              |     |     |                                |
|------------------------------|-----|-----|--------------------------------|
| Campbell, Calcutta           | ... | 390 | 18                             |
| Dacca School                 | ... | 280 | 2                              |
| Royapuram, Madras            | ... | 280 | 11                             |
| P. of Wales' School, Tanjoro | ... | 132 | ...                            |
| Vizagapatam                  | ... | 112 | ...                            |
| Hyderabad (Sind)             | ... | 137 | ...                            |
| The B. J. School, Poona      | ... | 168 | ...                            |
| The B. J. School, Ahmedabad  | ... | 200 | 2                              |
| Agra School                  | ... | 618 | 61                             |
| Ludhiana (Females)           | ... | ... | 21                             |
| Burma School                 | ... | 100 | 7                              |
| Temple School, Patna         | ... | 131 | ... (includes 96 compounders.) |
| Cuttack School               | ... | 151 | 5                              |
| Berry White School, Assam    | ... | 149 | ...                            |

It may safely be said that the accommodation provided for would-be medical students is entirely inadequate, and radical and extensive changes and enlargements are urgently necessary all over India, and the question is receiving the serious attention of all local Governments.

## Current Topics.

## NOTES ON THE REDUCTION OF FLIES IN CANTONMENTS.\*

"THE reduction of flies in cantonments is one of the most important subjects than we can consider because of the connection of house-flies with disease. I look upon the defective systems in operation, where there is any system at all, as one of the most serious blots on our sanitary methods. House-flies, like mosquitoes, invade dwellings in the neighbourhood of their breeding-places. It is highly probable that where flies are widespread in a cantonment, their breeding-places are universal. There are some exceptions to this; instances in which the cantonment is directly conterminous with, or dovetails into, the neighbouring town; but these are few and far between. The sanitary officer should have no difficulty in locating these breeding-places. When breeding-places are ascertained, he should not rest satisfied until they have been abrogated and had stopped the practices that gave rise to them.

The questions of the influence of flies in the production of diseases, and the best methods of reducing their numbers, are amongst the more important with which we have to deal. The fly problem is one with which all military medical officers should make themselves thoroughly familiar.

Flies carry infection by settling on human excreta or other foul material, and then alighting on food, water, etc. The diseases they mostly carry are enteric and para-typhoid fevers, dysentery, infective diarrhoea and cholera; other diseases they may carry are sepsis, tetanus, and, rarely, gas-gangrene. Apart from their importance as carriers of disease germs, flies in any great number add considerably to the discomforts of climate and the conditions of life generally, both in peace and war—they may be a veritable pestilence. The presence of many flies in a cantonment or a camp is a sign of either sanitary neglect or that there are breeding-places in the near vicinity, such as latrine trenches, manure heaps, piles of refuse, animal or vegetable, etc. The fly-nuisance can be greatly reduced by sound and careful sanitation, burning of human and animal refuse, and general cleanliness of barracks, camps, and their surroundings. The most comprehensive way to keep flies down is to dispose of all night-soil, stable litter, and refuse systematically, and to catch or poison the flies as fast as they appear. Mule and horse refuse and cow-dung breed flies only when they contain a certain amount of moisture, and when

\* Communicated by D. D. M. S. Northern Command. Surgeon-General P. Hehir, being an address delivered at the Sanitary Conference on 10th May, 1918.

the temperature in the manure is not above 40°C. nor below 30°C.

The insect under reference is the common house-fly—*musca domestica*.

Briefly, the life-history of the fly is as follows: Each female lays about 120 to 150 eggs at a time; under favourable conditions these in a day or so develop into small white larvæ or maggots, which increase in size daily, and in a week are full-grown nymphs or chrysalides; the flies hatch out about the tenth day after the eggs are laid. As each fly begins to lay eggs ten days after emerging, and deposits six batches in a summer, that is, roughly about 1,000 eggs altogether, the extraordinary prevalence of flies when a complete and systematic method of dealing with them is not carried out can be readily understood. The vast fecundity of the fly should be constantly borne in mind.

Flies collect in kitchens and wherever exposed food is kept or stored, in latrines, incinerator sheds, and in covered stables; in windy weather and during the hottest parts of the day these are their favourite resorts. The adult fly may be destroyed in many ways. Large numbers may be killed by the use of *fly-flaps*, of which there are many kinds; some are made with a wire, leather, or canvas flap attached to the end of a wooden handle—the first-named is the best.

There are various forms of glass or woven wire *fly-traps* which are baited with sugar solution or other substance. The ingenious Japanese clockwork mechanical fly-trap, consisting of a slowly revolving wooden cylinder coated with *gur*, is effectively used in hospitals, messes, cook-houses, etc. The flies are trapped by a ledge projecting on the cylinder and diverted into a box underneath. This apparatus is efficient while it is in action; the clockwork requires careful attention or it gets out of order. There are various other wire cages, globular and rectangular with inverted edges below, the bait resting on a wooden stand; the fly gets in but cannot escape. On this principle is the fly-trap, the sides and top of which are of muslin.

Fly-papers coated with a sticky mixture of various forms are very efficacious—one of the best known is "Tangle Foot." When used on a large scale, the fly-papers on the market are very expensive. In a cantonment of, say, one brigade, from 5,000 to 10,000 fly-papers would be required weekly; it is cheaper and more effective to prepare the sticky mixture and issue it on wires than can be hung in suitable places, collected, the flies burnt off, re-coated and re-issued. The wire surrounding chopped straw (*bhoosa*) bales serves this purpose. The wires are cut in lengths of 2 feet and bent at one end so as to be hung up. Telegraph wire answers the purpose also.

Various sticky mixtures are in use. The best is made by heating 4 pints of country castor oil

in an open pan such as is used for jam-making, then stir in it 9½ lb. of crushed and powdered resin, and continue heating and stirring, without boiling, until the resin is dissolved. This mixture can be applied to paper, string, old tent ropes, or to wires. Another mixture is raw linseed oil 5 parts and resin 12 parts. The oil is heated sufficiently to dissolve the resin, which is added in fine powder, and the papers or other articles are dipped when the composition is hot. When wire is used, one end is left clean to be handled. Of these wires, 500 can be carried in a kerosene oil tin or petrol drum with the top knocked out, and fitted with a rope or wire handle. The wires are hung on nails, or from any suitable purchase where flies congregate, and removed when covered with them. From 200 to 300 may be caught on one wire, the average being about 100. They are collected, placed on a fire, the flies burnt off, wiped with a piece of rag or newspaper, and re-coated with the mixture. A few thousand wires will suffice for a single battalion. They should be hung up in kitchens, food stores, messes, latrines, incinerator sheds, and, when flies are numerous, in huts, tents, offices, hospitals, etc. They are easily suspended in tents by hooking the bent end into each of the ventilators, or by hanging the wires on a string stretched between the tent poles seven feet off the ground. They are most serviceable in kitchens and latrines. In order to prevent the sticky mixture running off the ends of the wire, place a piece of cork on the tip of the wire, or use a screw of paper, or pine cone if in a coniferous region. The cost of the sticky mixture to coat 2,000 wires is less than a rupee; a man who becomes an expert at the process can make the mixture and coat 6,000 or 7,000 wires in a week. The wires of *bhoosa* bundles must, of course, be straightened first; any other thick wire answers quite well. Wires are better than paper. Flies tend to settle on hanging objects and prefer dark surfaces; the wires catch the flies quicker than fly-paper.

Flies can be poisoned in the neighbourhood of manure heaps by spraying latrine screens, bushes, straw, etc., with water containing a little sugar and one ounce of *sodium arsenite* to the gallon. Arsenious acid, with carbonate of sodium or washing soda, does quite as well as the arsenite, which may be difficult to obtain. Arsenious acid is sold in the bazars as *sankiya*. They may also be poisoned by placing saucers or flat plates containing milk and formalin solution (a teaspoonful to four ounces) in rooms where no other liquid is available for them to drink; a little sugar is an advantage, as is also an island of bread in the centre of the saucer or plate. Do not use it stronger or they will not drink it, nor weaker as it will not kill them. They do

not die at once, but in about 15 minutes, and usually away from the milk; it is therefore not suitable for kitchens; as used there they are often found dead on the food; it is very suitable in barracks, tents, huts, offices, latrines and hospitals.

There are other ways to keep-down the number of flies in camps, hospitals, etc., applicable under varying conditions; what is most important is to prevent flies having access to infective material.

The dressings from wounds in hospitals are very attractive to flies, and must be put into covered receptacles and burnt. All infective excreta of hospitals should be incinerated in a small, separate incinerator kept for that purpose. The smearing of all latrine buckets with heavy oil is an effective but not a complete deterrent to flies; hence all latrine buckets should, when possible, be kept covered up. All waste foods should be removed and burnt.

These methods of dealing with adult flies are only expedients to mitigate the nuisance; they do not eradicate flies. Complete abrogation can only be attained by doing away with their breeding-places.

I would express the conviction, the result of experience in dealing with the fly for over thirty years, that a very large number of those that infect our cook-houses, barracks, and hospitals breed either in the cantonment or in the immediate precincts thereof, and that this breeding can be controlled, and in some cases absolutely abolished. I could quote several instances, both in cantonments and on service, where a pestilence of flies has been removed under my own supervision, but it has always been associated with much hard work and perpetual driving of all concerned whilst the anti-fly campaign was at its height. On two occasions I had to utilise all the powers that an A. D. M. S. can employ before the task was achieved—one has been obliged to have whole units at work in collecting and incinerating the refuse, dry and animal, that they had systematically dumped in or near their own lines.

There is no golden rule to follow, nor any easy way of getting rid of flies once they have been allowed to generate universally. One has had some desperate times in these combats. My greatest difficulty was in making people assisting me understand that they are not eradicated by a spasmodic effort, no matter how strenuous it is. It is, instead, one persistent, grinding labour until the task is finished.

A cantonment swarming with flies, and there are many, is a positive indication of neglected sanitation; such a cantonment is discreditable to all concerned with its sanitation. I cannot refrain from expressing myself very strongly on this neglect of the fly-nuisance that has been allowed to continue in many cantonments unchecked. I

earnestly hope that a genuine, solid, and persistent effort will be made to efface this stigma on our sanitary methods. I will enumerate some instances in which I have found flies breeding in countless numbers in various lines during the last eight months. In one station, all the litter of all the cavalry stables was dumped in heaps adjacent to the lines. It was supposed to be removed by a contractor, but was not. The hard-cased pupæ were seen in myriads in the lower layers of these dumps. In two cases identically the same conditions existed in mule corps lines. In over a dozen instances I have found large quantities of such litter accumulated at night-soil incinerators breeding flies prolifically. Little attempt was made to dry the litter before storing it, and sometimes there was sufficient fuel for several weeks. The custom in these cases appeared to be to throw fresh litter on the old, the maggots thereby being provided with all the conditions required to breed uninterruptedly. In a few instances I have found the latrines of Indian troops in a disgustingly foul state, with all the indications of continual neglect, and with every pan and every intermediate receptacle full of seething, putrefying, fæces, and the latrines almost enveloped in a complete layer of flies. In other instances things were verging on this grave state of insanitation. These are from recorded cases and not general statements; they are illustrations of deplorably neglected sanitation. It is unnecessary to enter further upon the measures to be adopted in the reduction of flies; they are parts of our stock-in-trade. The experience of the present war has, however, multiplied the means that may be employed in competing with the fly; I will only remark that there are several of the measures that I have not seen in use, such as the solution of arsenite of sodium, packing manure dumps to raise the temperature by fermentation sufficient to kill maggots, and other methods.

If the methods of eradicating flies are not practised in cantonments, it is all but morally certain that they will not be adopted on service, and much preventable disease will be the result.

I would suggest that all Sanitary Officers and Senior Medical Officers give this subject their earnest attention. It is not necessary to refer at greater length to the relations of the house-fly to certain diseases: do away with the pest and you will remove one of the most widespread causes of these diseases."

#### DENGUE FEVER IN AUSTRALIA\*

A VALUABLE monograph on the history, course and etiology of dengue fever occupies the whole

\* Also published separately as a Government Report.—ED.



number of the *Journal of Hygiene* (January 1918, Vol. XVI.—I.) by Dr. J. Burton Cleland, Dr. Burton Bradley, and Dr. W. McDonald, all of Sydney.

The epidemic dengue is said to have first reached Australia in 1885; it also reached the Fiji Islands in the same year, and was said to have been conveyed by a European passenger. It is probably that Australia received the disease from Fiji.

The paper is a long one, and we can here only find room for the following summary made by the authors. We commend the paper to the attention of those interested in the minor fevers of India:—

1. Dengue fever in Australia is undoubtedly an introduced disease. It has been existent from time to time in epidemic form since 1885.

2. The clinical description of the disease agrees with that of the dengue described in text-books, the only departure noted being the distinct tendency to a relatively, and sometimes absolutely, slow pulse rate as compared with the temperature.

3. It is possible that under the single term "Dengue" more than one disease is at present included.

4. Epidemic dengue in Australia is approximately co-extensive with the known distribution of *Stegomyia fasciata*. It does not extend beyond the area in which this mosquito is prevalent.

5. *Stegomyia fasciata* mosquitoes caught in a dengue-infected district in the surroundings of cases of the disease, and some of them known to have fed on a dengue patient on the first and second days of his illness, transported to a non-dengue district, reproduced the disease in four out of seven persons on whom biting experiments were conducted.

6. Blood taken from three of these four cases reproduced the disease when injected into further persons. The blood of one case was not tested.

7. The incubation period of the four cases was found to be possibly between five and nine and a half days, probably between six and a half and nine and a half days, counting from the bitings to the definite onsets.

8. No known case of contagion occurred from any of the above four cases.

9. No evidence was obtained from two cases, one of which was heavily and repeatedly bitten with *Culex fatigans*, that *Culex fatigans* is capable of acting as a transmitter of dengue fever.

10. The blood of patients suffering from an attack of dengue can reproduce the disease when inoculated subcutaneously into healthy persons.

11. The disease thus inoculated is typical in every way of dengue fever naturally contracted. The inoculated disease may or may not show marked skin rashes and double phases in the temperature charts, and presents a relatively, and sometimes absolutely, slow pulse; such variations occur in the natural disease. The incubation period of the inoculated disease varies from five to nine days, corresponding with the incubation period of the mosquito-transmitted disease.

12. Results of the inoculations shew that:

(a) The virus of dengue is present in the blood as a whole.

(b) The serum of clotted infective blood may contain the virus.

(c) With washed corpuscles one apparently positive result was obtained out of three experiments.

(d) The fluid part of citrated infective blood may contain the virus.

(e) With Pasteur-Chamberland filtrates of infected serum and corpuscles, one positive result was obtained out of five experiments.

In considering these results, failure to convey the disease must not necessarily be interpreted as meaning that the menstruum employed never does contain the virus, as in some of the cases the blood may no longer have been infective at the time at which it was withdrawn.

(f) The presence of the virus in the blood has been demonstrated on the second and third days of the disease. Two experiments made may possibly be interpreted as shewing that infective material may still be present on the eighth day of the disease.

(g) One experiment appears to indicate that the virus is no longer present in the blood on the fourteenth day from the beginning of the illness.

(h) Immunity to the inoculation of infective blood appears to be complete twenty-four days after recovery from a typical attack of dengue.

(i) Infected blood may maintain its infectivity outside the body if kept in a cool place for seven days at least.

(j) In two instances two individuals inoculated with the same material on the same day exhibited incubation periods practically identical in duration.

(k) The infection of dengue can be conveyed by sub-inoculations from individual to individual at least to the fourth generation without the resultant disease departing from the type of the natural disease.

(l) The disease has not been conveyed by the application of infective serum to a scarified area; nor apparently has it been conveyed by the application of infective material by swabbing to the nostrils.

(m) A very doubtful and probably negative result followed the gargling of the throat with infective material followed by swallowing of the same.

(n) Dengue fever has close analogies with yellow fever.

#### FUTURE INVESTIGATION.

The following points require elucidation by further research and we trust that later we may have an opportunity of doing this:

1. To ascertain the period that must elapse after *Stegomyia fasciata* has bitten a dengue patient before the insect can transmit the disease to another human being.

2. To ascertain the length of time that such an infected mosquito may remain infective.

3. To ascertain whether the virus can be transmitted through the eggs to the progeny of such infected mosquitoes.

4. To ascertain whether *Culex fatigans*, *Scutomyia notoscripta*, or any other mosquito can also act as intermediate hosts of the organism of dengue.

5. To ascertain for how long after the third day of the disease the virus may still exist in the blood of the patient.

6. To ascertain how long immunity after an attack may last.

7. A repetition of the experiments suggesting that the virus may be able to pass through a Pasteur-Chamberland filter.

8. A repetition of the experiments with washed corpuscles to ascertain whether the organism exists as an intra-corpuscular parasite or merely becomes attached to the corpuscles.

9. A repetition of the experiments with serum to ascertain whether the positive results obtained from this source were due to accidental inclusion of infected corpuscles, or liberation of parasites into the serum from injured corpuscles, or whether these results were due to the virus being a natural inhabitant of the serum.

10. A repetition of the experiments with ingested blood and with the application of infected material to

the nares and to local scarified areas to ascertain whether the virus so ingested or applied can induce the disease.

#### THE LOUSE-TRANSMISSION OF RELAPSING FEVER.

THE following note by Prof. Nuttall is taken from *Parasitology* (Vol. 10, November, 1917) and is of considerable importance in India where relapsing fever may be said to be endemic:—

"Epidemiological evidence, as in the case of typhus, points to relapsing fever being louse-transmitted. The two diseases occur under like conditions: personal filth and squalor, the close contact of persons through overcrowding, facilities being offered for the propagation of lice by the continuous wearing of clothing day and night for weeks or months on end. All recently collected evidence (from India, North Africa, Germany, Russia and Serbia) proves that lice are constantly present on infected persons. These remarks apply equally to typhus, which, as already stated, may co-exist with relapsing fever in epidemic form. Judging from the accessible records, relapsing fever appears to be somewhat more restricted than typhus in its geographical distribution. It has been conclusively demonstrated by carefully conducted experiments that *Pediculus humanus* serves as a carrier of *Spirochaeta recurrentis*, the causative agent, from man to man.

"When lice imbibe infected blood, the spirochaetes disappear rapidly from their alimentary canal and are not discoverable even by the ultra-microscope for a period of about 2-6 days after the insects have fed. The spirochaetes reappear in the ecclomic fluid of the lice usually on the 8-9th day. They at first appear small, but, as time proceeds, they attain the dimensions and appearance they possess in human blood during the attack. When lice feed on infective blood, the number of insects that become infected with spirochaetes ranges from 10 to 42 per cent. The spirochaetes are hereditarily transmitted in the louse, for the offspring of an infected female has been shown to be infective. This persistence of the spirochaetes in the louse no doubt serves to maintain them in nature. It has only been through the successful raising of lice under laboratory conditions, coupled with the use of monkeys and, occasionally, man for infection experiments, that it has been possible to demonstrate the phenomena herein described.

"Although lice may be infective for a few hours after they feed on relapsing-fever blood, it is probable that infection will rarely occur by their transference from man to man soon after feeding. When a louse has fed, it usually remains quiet, whilst digesting its meal. When lice have hungered for any length of time, as we have frequently observed, they feed to excess and take a longer time to digest the large amount of blood imbibed. If such lice are kept cold the process of digestion is impeded, and I have no doubt that any spirochaetes which they may harbour will remain virulent for longer periods, as I found was the case in bugs. How long gorged lice may remain infective at a low temperature remains to be determined. The experiments herein recorded point, however, to a rapid loss of infectivity in lice under ordinary conditions prevailing after an infective meal. The spirochaetes vanish in lice in which they subsequently reappear. Just before their reappearance, usually on the sixth day, but at times on the third to the fifteenth day, the lice have been found to be most infective. The infectivity of the louse does not depend upon the presence in its body of visible spirochaetes, in fact when spirochaetes reappear and attain their full size the lice are non-infective (Nicolle). This, coupled with the observation that human blood

is infective during the apyrexial stage, when spirochaetes cannot be found in the blood (Sergent and Foley), certainly bears out the view, which I have upheld with others, that spirochaetes are Protozoa, for they obviously undergo a cyclical development in both the vertebrate and arthropod hosts. Nicolle advances the view that the typical spirochaete is incapable of multiplication or that it rarely divides, and that multiplication and consequent infectivity are entirely or largely confined to the minute forms which may coincide with the "coecoid bodies" of some authors, assuming that they are not ultra-microscopic.

"It has been proved that lice do not convey relapsing fever by their bites. As Nicolle and his colleagues have shown, persons may be bitten many thousands of times by infective lice with impunity. Infection takes place through the lice being crushed upon the skin, which is commonly excoriated by the self-inflicted scratches of the individual harbouring the lice. Infective material may, moreover, be carried on the fingers to the nose or eye, and it has been demonstrated experimentally that the spirochaete is capable of invading the system through intact mucous membranes.

"The period of incubation, under experimental conditions, as observed in man and monkeys following infection through the excoriated skin or intact mucous membrane, is 6-8 days, when crushed lice in the infective stage are used. This corresponds with clinical experience. A single infective louse crushed upon the excoriated skin has produced relapsing fever. Persons have been experimentally infected by placing infected lice upon their persons without their knowledge. Happily for these subjects and for the experimenters who intentionally infected themselves, the course of the disease can be cut short by the arsenical treatment discovered by Ehrlich."

#### MEDICAL NOTES FROM CHINA.

THE *Chinese Medical Journal* for March, 1918, is an excellent number containing many articles of interest, among which we can only mention a few:—Dr. C. A. Hedblom discusses the incidence of appendicitis in China and concludes (as we might conclude of India) that it is of relatively frequent occurrence, and quotes a sensible remark of Dr. Burdette, of the Manila Hospital, that "race or nationality plays no part or little part in the real relationship of appendicitis to mankind. The fault in statistics is that European patients come more readily to the physician, while Asiatic cases are hard to get."

Dr. E. C. Peake, of Tientsin, describes a protozoal parasite which has not hitherto been described. He describes many cases of the "new" disease, which he thinks is a "sister disease to kala-azar (anæmia, fever, leucopenia, large mononuclear increase, weakness, epigastic discomfort, and diarrhoea). The microscopic discovery of the parasite is, he tells us, easy, in the peripheral blood.

Dr. A. H. Woods, of Canton, has a good article on spinal cord diseases of the Chinese, and an unexpected variety has been found, and we might say the same of India where those who are on the look-out for them (as for example the late Surgeon-General Sir G. Bomford) will find every variety. Locomotor ataxy is certainly found

Dr. Emily Garner, of Shanghai, has a valuable article on pelvimetry and cephalometry of the Chinese. We quote the following figures which may, with advantage, be compared with Indian statistics:—

The figures given by different authors vary so widely that it was deemed advisable to choose medium measurements for the purpose of comparison.

TABLE I.

| Pelvis:      | Intersp. diam. | Interer. diam. | Baud. diam. | Diag. conj. |
|--------------|----------------|----------------|-------------|-------------|
|              | cm.            | cm.            | cm.         | cm.         |
| European ... | 25.5           | 29             | 19.25       | 12          |
| American ... | 25.35          | 27.5           | 20.3        | 13.5        |
| Chinese ...  | 22.975         | 25.35          | 18.27       | 11.52       |

Fœtal head diameters:

|              | O. M. | O. F. | S. O. B. | F. M. | Bipar. | Wt.   | Lgt. |
|--------------|-------|-------|----------|-------|--------|-------|------|
|              | cm.   | cm.   | cm.      | cm.   | cm.    | gm.   | cm.  |
| European ... | 13    | 11.5  | 7.75     | 7.75  | 9      | 3,400 | 50   |
| American ... | 14    | 11    | 9        | 9     | 9      | 3,400 | 50   |
| Chinese ...  | 12.7  | 10.68 | 9.17     | 7.8   | 8.5    | 3,080 | 51   |

A moment's study of these figures will show that all the Chinese measurements, except that of the length of the child, are less than the American, and all but two of the cranial diameters—suboccipito-bregmatic and fronto-mental—are less than the European. No extremes were included in the Chinese figures.

In 1,300 diagonal conjugate measurements, 3.9 per cent. were below 11 cm.; 0.76 per cent. were below 10; 5.2 per cent. were below 13.5 cm.

Among those not included in this statement were two which measured 14 cm.; two, 8 cm.; and one, 6 cm. The last was a Cæsarean section case, the operation having been performed three times.

Of 1,502 cases delivered in the Margaret Williamson Hospital, Shanghai, 31 per cent. were in labor when brought in, the midwife not having been able to deliver. The question naturally arises, what is the cause of the dystocia? Hence a study was made of these cases, the pelvic diameter of greatest importance alone being taken, and they were compared with an equal number of normal cases. The results are seen in the table below.

TABLE II.

|                            |            |
|----------------------------|------------|
| Pelvis:                    |            |
| Midwife cases, Diag. conj. | 11.347 cm. |
| Normal " " "               | 12         |

Infants—Head diameters:

|                   | O. M. | O. F. | S. O. B. | F. M. | Bipar. |
|-------------------|-------|-------|----------|-------|--------|
|                   | cm.   | cm.   | cm.      | cm.   | cm.    |
| Midwife cases ... | 12.9  | 10.87 | 9.315    | 7.95  | 8.76   |
| Normal " " "      | 12.1  | 10.57 | 8.95     | 7.04  | 8.6    |

It is seen by this table that there is not much difference between the two classes of cases, except that the pelvis is a little smaller and the fœtus a little larger in the cases from the midwives.

Mr. Cecil Davenport, F.R.C.S., of Shanghai, writes of the value of a substitute for santonin, viz., *quisqualis indica*, which is said to be "a safe and efficient vermifuge." He tells us that it is called in India "Rangoon creeper," but we find no reference to it in Watt's *Commercial Products of India*. The shells (or pericarps) are baked and pulverised, the dose is about 2 drachms with castor oil or epsom salts. It is very cheap in Shanghai and very successful in ascariasis. In these days when the price of real santonin is prohibitive and what is sold as such is, often, yellowed boric acid, it would be a good thing if

the Medical Store Depôts could introduce this cheap drug into India.\*

An editorial article refers to the re-appearance, after 7 years, of pneumonic plague in North China.

Dr. J. H. Ingram writes of the "pitiable condition of the insane in North China." There is only one decent asylum in China, viz., that at Canton, and it is much overcrowded.

The treatment of bilharzian hæmaturia has not hitherto been satisfactory, and as cases are likely to be met with in India it is worth while noting that, in the *Journal d'Urologie* Diamantis claims that emetin is of great use.

"The great danger in this disease is the urinary infection which sooner or later becomes superadded. Specific treatment, however, is possible only in the uninfected stage, in which the patient merely exhibits hæmaturia at the close of micturition and occasionally a distinct parasitic æmia. While in already infected cases, except in the presence of only a catarrhal cystitis without infiltration of the floor of the bladder or the prostate, *emetine* had no favourable action, he found it to have a striking effect in the uninfected cases, a series of about twenty intravenous injections of the remedy yielding a complete clinical cure. The drug does not produce its effect as a hæmostatic, for it had no action on hæmaturia in a case of tumour of the bladder; in bilharziosis the hæmaturia does not re-appear when the drug is stopped, and, furthermore, it causes the ova to disappear from the urine. It must therefore act as a specific, and if it does not kill the worm, it at least arrests the formation of ova. The initial amount given is 0.02 to 0.03 gram, the dose being then increased rapidly to 0.05, 0.07, and 0.1 grain. Small doses are inefficient. The injections are given at intervals of two or three days, until a clinical cure results; this usually requires fifteen or twenty injections, though one case recovered under eight injections. In children the drug is given subcutaneously. In some patients, recovery is already of twenty-two months' standing. No serious result has attended the use of the large doses mentioned, though dizziness is regularly produced, together with marked lassitude, coated tongue, swollen gums, and salivation, which rapidly pass off when the drug is discontinued."

## Reviews.

**Glaucoma—A Hand-book for the Student of Ophthalmology.** By LT.-COL. R. H. ELLIOT, I.M.S. (Retd.). London, Demy 8vo. 21s. G. Pulman & Sons.

DURING the past 15 years the literature of glaucoma, consisting of various papers, has grown to a size proportionate to the importance of the disease, and this volume not only gives the author's views but presents all the latest and best work in a readily accessible form.

\* In this connection,—Why is santonin not made in India? One variety, *Artemisia absinthium*, is a very common aromatic herb, or weed in Kashmir and all over Sikkim. The official santonin is made from *A. maritima*, a common plant in the Himalayas, but is usually imported. (Its native name is *Kirmala-owa*.) (Vide Watts, *op. cit.*, p. 23.)

the main objection to Smith's operation. Their various degrees of severity. In clean technique is based, he says, on twenty years perforating wounds, conservative treatment is active work in the capsulotomy method, very successful. All cases of perforating wounds seven hundred intra-capsular operations, fifth large apertures of entry or exit and the hundred and seventy-six of which were performed. Projectile retained should be operated on, with in Amritsar, under the direct supervision removal of the wound track, projectile and other Lieutenant-Colonel Smith. The modification, foreign bodies, etc., and for this an adequate consists in holding the upper and lower lids open exposure is very necessary. We are glad to see by means of double hooks, specially designed that the introduction of drainage tubes into the himself, and in using a needle to remove the lens is unhesitatingly condemned. Fullerton's in cases where vitreous loss seems imminent method of excision of the knee appears very has actually occurred, or where the lens refused.

to be delivered after the use of much pressure. Injuries of the peripheral nerves is the next is considered safe, Smith's spoon being reserved for any case in which the lens slips back into the eye, preventing the use of the needle. Emphasis is laid upon the absolute necessity of dealing very tenderly with the nerve when

The use of four-week-old kitten's eyes is advised, is being sutured, and of accurate apposition for practice in the section and in the use of the two ends. Nerve anastomosis is condemned as useless. Suture of divided nerves at protest, however, against his method of killing the time of either primary or secondary closure kittens by strychnine even if it is "convenient for the wound is recommended.

The final chapter is on gunshot wounds of Dr. Fisher is one of the few ophthalmic surgeons who have published the results of the operation on the lungs and pleuræ. The mortality is discussed they have performed by Smith's method, after then the pathological anatomy, the occurrence of hæmorrhages distant from the original their return to America, so that the result injury as a result of "Contrecoup" is mentioned, now given by him of ninety-four such operations, and also that the opposite lung suffers damage. done consecutively and of great interest. Fifty as regards treatment, there is total agreement six of them obtained vision of  $\frac{2}{10}$  or better, on one point, that is, the necessity for the Thirty more had vision of  $\frac{2}{10}$  or better, five earliest and most perfect immobilisation. Im-had  $\frac{2}{10}$  and three had no sight. No case of immediate intervention is recommended in the suppurated. The causes of poor vision were, ever types of injury, and a thorough operation iridocyclitis, 3; glaucoma, 4 (and one occurring in the case of infected hæmothorax followed by three months later); choroiditis, 5; rupture, the use of the Carrel-Dakin technique. A rifle capsule, 3; detached choroid, 2, of which one bullet or small piece of shell may be left with obtained  $\frac{2}{10}$ , and the other left hospital on the impunity in the lung tissue, but larger pieces tenth day, with eye quiet but history incomplete, should be removed as they are usually infected. and included among the three lost eyes; optic there is an excellent description of the techni-atrophy, 1; temporary insanity, 1; hæmorrhage to be employed.

of choroid, 1; drawn-up pupil sufficient to be lowered, 1; detached retina, 1. The three with While there is much new information in this retained capsule might have been improved in author has found it necessary to emphasize the they could have been needled. The number of importance of older well-established measures, prolapses of vitreous is not given, nor is it stated such as rest and immobilisation.

what connection such prolapses had, if any occurred, with the cases of poor vision or with the cases of detached choroid or retina. No case of prolapse of iris is recorded. The number of cases of post-operative glaucoma is very high—over 5 per cent. They occurred (1) 10 days (2) 2 weeks, (3) 6 weeks, (4) 2 months, and (5) 3 months, after operation. The proportion of cases with good visual results is creditable—seventy-two out of 94 obtained  $V = \frac{2}{10}$  or better but the number of poor results is also high and the enumeration of the cases of poor vision given above is instructive. Of 94, 58 were immature and 36 mature cataracts.

Dr. Fisher's monograph well illustrated and should be of much use to those practising Smith's operation.

## SPECIAL ARTICLE.

### THE SANITARY COMMISSIONER'S REPORT (INDIA).

THE Annual Report for 1916 reached us early in May, 1918, and as usual is full of interest.

*European troops.*—In 1916 the average strength was over 60,700. The death-rate was only 6.54, but the invaliding rate was 22, the statistics are under war conditions, the physically unfit were largely kept in India, and healthy men sent to oversea forces. The admission rate for malaria was 186, as compared with a five-year average of 123 per mille. What is now called "Enterica" accounted for only 5.2 per mille

the main objection to Smith's operation. The technique is based, he says, on twenty years of active work in the capsulotomy method, and seven hundred intra-capsular operations, five hundred and seventy-six of which were performed in Amritsar, under the direct supervision of Lieutenant-Colonel Smith. The modification consists in holding the upper and lower lids open by means of double hooks, specially designed by himself, and in using a needle to remove the lens in cases where vitreous loss seems imminent or has actually occurred, or where the lens refuses to be delivered after the use of much pressure as is considered safe, Smith's spoon being reserved for any case in which the lens slips back into the eye, preventing the use of the needle.

The use of four-week-old kitten's eyes is advised for practice in the section and in the use of Smith's spoon and Fisher's needle. We must protest, however, against his method of killing the kittens by strychnine even if it is "convenient" and "cheap."

Dr. Fisher is one of the few ophthalmic surgeons who have published the results of the operations they have performed by Smith's method, after their return to America, so that the results now given by him of ninety-four such operations done consecutively and of great interest. Fifty-six of them obtained vision of  $\frac{2}{20}$  or better. Thirty more had vision of  $\frac{2}{100}$  or better, five had  $\frac{2}{200}$  and three had no sight. No case suppurated. The causes of poor vision were: iridocyclitis, 3; glaucoma, 4 (and one occurring three months later); choroiditis, 5; ruptured capsule, 3; detached choroid, 2, of which one obtained  $\frac{2}{20}$ , and the other left hospital on the tenth day, with eye quiet but history incomplete and included among the three lost eyes; optic atrophy, 1; temporary insanity, 1; hæmorrhage of choroid, 1; drawn-up pupil sufficient to be lowered, 1; detached retina, 1. The three with retained capsule might have been improved if they could have been needled. The number of prolapses of vitreous is not given, nor is it stated what connection such prolapses had, if any occurred, with the cases of poor vision or with the cases of detached choroid or retina. No case of prolapse of iris is recorded. The number of cases of post-operative glaucoma is very high—over 5 per cent. They occurred (1) 10 days, (2) 2 weeks, (3) 6 weeks, (4) 2 months, and (5) 3 months, after operation. The proportion of cases with good visual results is creditable—seventy-two out of 94 obtained  $V = \frac{2}{20}$  or better; but the number of poor results is also high and the enumeration of the cases of poor vision given above is instructive. Of the 94, 58 were immature and 36 mature cataracts.

Dr. Fisher's monograph is well illustrated and should be of much use to those practising Smith's operation.

**American Addresses on War Surgery.**—By Sir BERKELEY MOYNIHAN, C.B., Temporary Colonel, A.M.S. 12mo. of 143 pages. Philadelphia and London: W. B. Saunders Company, 1917. Cloth, 7s. 6d. net.

THESE five addresses are all very well worth reading. The first, which was presented at a convocation meeting of the American College of Surgeons, should interest others besides medical men as it discusses the causes of the war.

After a few remarks on what may be called the previous history of Prussia, pointing out how she has always exploited the doctrine of plunder, as exemplified in her actions and successes of 1864, 1866 and 1870, the author points out that the struggle is essentially one between tyranny on the one hand and liberty on the other.

The definition of these terms is worth quoting: "Tyranny implies a complete surrender of individual rights and liberties and an unquestioning submission of them to a power exercised exclusively from without." While liberty means "here the inalienable and inderogable right of every human being to express himself, to be himself, to develop from within."

This doctrine of tyranny implies that each individual must be so trained that he becomes a willing and obsequious servant of the State, and to this end all the machinery of education has been captured by the German State, and quotations are given showing how this educational control is used as a political weapon.

Another quotation may also be given: "Opinion in Germany, from the cradle to the grave, has been controlled and directed by the military, Macht politik and the policy of ruthlessness in warfare is; therefore, unanimously advocated by soldiers and citizens, scientists and clergymen, merchants and Roman Catholic priests." In other words, "they are all tarred with the same brush," and no differentiation, except in degree, can be made between the Hohenzollerns and the rest of the people. An interesting example is given as how ready-made opinions are thrust down the people's throats, or it would be better to say readily accepted since they were taught in the schools. The author was discussing, with a distinguished German colleague, English literature, and was surprised by the apt criticisms of the latter on various English authors; he discovered that the German had never read one of them, but these opinions were taught in the schools! Could slavishness go farther?

To come to the purely surgical addresses, the first is on gunshot wounds and their treatment. It is pointed out that the surgeon at the beginning of the war had rarely seen a profoundly septic wound and was faced with a new



problem to which he was at first unequal. The various factors which render a gunshot wound peculiar, such as the velocity, flight of the bullet, etc., and the infectivity of the surroundings in the fighting zone, are discussed and then the principle and the methods of treatment of these wounds.

The great need in these cases is to secure closure at the earliest possible moment, and this is obtained in the early hours by complete excision of the wound and its immediate suture, carried out with very thorough care and attention to detail.

Another side of the problem is presented when the wound has already suppurred, but still here the aim is also to close the wound as soon as possible. The various methods are discussed: Wright's, Carrel-Dakin's, Rutherford Morison's and the use of flavine compounds.

The author thinks that the success of the Carrel-Dakin treatment may possibly be due more to the Carrel technique than to the antiseptic. It is pointed out again that perfect sterility is not necessary for healing by first intention, and that when it is proposed to close the wound, the nature of the organisms as well as their number is of great importance.

The disadvantages of the Carrel-Dakin method are also mentioned, the main one being, if it is interrupted it fails.

As regards Rutherford Morison's method, which is, shortly,—thorough cleansing of the surrounding skin followed by scraping away of granulation tissue, removal of foreign bodies, etc. The wound is then packed with gauze for a moment or two and the new raw surface sponged over with methylated spirit and then smeared with bismuth, iodoform, paraffin paste ("Bipp"), so as to leave a thin layer on the surface, after which the wound is sutured without drainage, placed on a splint and left untouched for ten days.

Discussing the success of this method the author believes that this is almost certainly due to the perfect mechanical cleaning of the wound and not to the virtues of "Bipp." If there is a virtue in the paste it probably lies in the paraffin, which produces an anerobic condition in which healing can readily take place. Beck's theory that the effect produced by the bismuth paste is due to the decomposition of the bismuth subnitrate is not mentioned. Personally we believe that a good deal of the success of the use of bismuth paste or "Bipp" is due to the fact that dressings are much less frequent and that traumatism of the wound is avoided. Dichloramin T. is also highly spoken of and the flavine compounds are also discussed. Stress is also laid on the necessity of immobility of wounded parts under all conditions. Another address deals with wounds of the knee-joint in

their various degrees of severity. In clean perforating wounds, conservative treatment is very successful. All cases of perforating wounds with large apertures of entry or exit and the projectile retained should be operated on, with removal of the wound track, projectile and other foreign bodies, etc., and for this an adequate exposure is very necessary. We are glad to see that the introduction of drainage tubes into the joint is unhesitatingly condemned. Fullerton's method of excision of the knee appears very good.

Injuries of the peripheral nerves is the next subject, which is also very adequately dealt with. Emphasis is laid upon the absolute necessity of dealing very tenderly with the nerve when it is being sutured, and of accurate apposition of the two ends. Nerve anastomosis is condemned as useless. Suture of divided nerves at the time of either primary or secondary closure of the wound is recommended.

The final chapter is on gunshot wounds of the lungs and pleuræ. The mortality is discussed and then the pathological anatomy, the occurrence of hæmorrhages distant from the original injury as a result of "Contrecoup" is mentioned, and also that the opposite lung suffers damage. As regards treatment, there is total agreement on one point, that is, the necessity for the earliest and most perfect immobilisation. Immediate intervention is recommended in the severer types of injury, and a thorough operation in the case of infected hæmothorax followed by the use of the Carrel-Dakin technique. A rifle bullet or small piece of shell may be left with impunity in the lung tissue, but larger pieces should be removed as they are usually infected. There is an excellent description of the technique to be employed.

While there is much new information in this work, yet it is somewhat remarkable that the author has found it necessary to emphasize the importance of older well-established measures, such as rest and immobilisation.

## SPECIAL ARTICLE.

### THE SANITARY COMMISSIONER'S REPORT (INDIA).

THE Annual Report for 1916 reached us early in May, 1918, and as usual is full of interest.

*European troops.*—In 1916 the average strength was over 60,700. The death-rate was only 6.54, but the invaliding rate was 22, the statistics are under war conditions, the physically unfit were largely kept in India, and healthy men sent to oversea forces. The admission rate for malaria was 186, as compared with a five-year average of 123 per mille. What is now called "Enterica" accounted for only 5.2 per mille

against an average of 3.1. Venereal diseases gave a ratio of only 36, against the average 49.

As for *malaria*, the Peshawar division, and next the Mhow division, showed the highest admission rates, and the Secunderabad, Burma and Lucknow areas the lowest; benign tertian was far and away the most common infection in 181 cases examined. *Sandfly fever* gave a ratio of 45 per mille of strength, Nowshera being by far the worst place.

The unsatisfactory "P.V.O." gave an admission rate of 7. It is a vague heading, but not more so than the older "simple continued fever." We agree that the increasing disuse of the term "probably indicates greater discrimination and care in diagnosis;" some of the cases returned as such at the hill station of Dalhousie are said to have been probably cases of "occult" malaria.

*Enterica*.—An admission ratio of 5.2 and a death-rate of .54. Enteric fever was diagnosed in 116 cases, with 27 deaths; paratyphoid A in 194 cases, with 6 deaths; and paratyphoro B, 8 cases and no deaths. No less than 791 cases were received at the Naini Tal Depôt, of which 246 were found (!) to be "of uncertain origin."

*Anti-enteric inoculation* is required every two years:—

"During the year, specific organisms of the typhoid group were found in the excreta of 37 convalescents, the distribution of these carriers being:—*B. typhosus*, 2; *B. paratyphosus* A., 31; *B. paratyphosus* B., 4.

The following carrier is of special interest:—The patient stated that in March, 1912, at Peshawar, he had an attack of acute nephritis and had "trouble with his urine." In December, 1915, at Rawalpindi, he was admitted to hospital with symptoms of cystitis, and examination revealed that he was suffering from *B. paratyphosus* A bacilluria. The history of the case suggests that his illness in 1912 was due to an infection of this organism. This case is cited as an example of a carrier of the most prolific and dangerous type.

The Officer in charge of the Depôt reports the incidence of a few cases of double infection by two members of the Enteric group.

Over 93 per cent of all European troops serving in India have been inoculated; 67 per cent were inoculated or re-inoculated during the year 1916. In the early part of the year *B. typhosus* vaccine was used, but this was gradually replaced by triple vaccine, as the former afford little or no protection against paratyphoid fever.

The strength of the T. A. B. vaccine used contained:—

|                                  |            |
|----------------------------------|------------|
| 500 million <i>B. typhosus</i>   | } per c.c. |
| 375 do. <i>B. paratyphosus</i> A |            |
| 375 do. <i>B. paratyphosus</i> B |            |

In the first quarter of the year, in a small proportion of inoculations, the Millbank vaccine of double the above strength was used.

Two inoculations were given as heretofore,  $\frac{1}{2}$  c.c. followed by 1 c.c. at an interval of 10 days.

Efforts were made to ensure that all Indian cooks, mess servants and others who had anything to do with the handling of food were inoculated.

The work done in divisional and brigade laboratories has expanded considerably in the isolation and detection of bacilli of fevers clinically suspected of belonging to the enteric group. In the majority of such cases, blood-cultures and examinations of urine and faeces were carried out."

*Dysentery*.—The tendency seems to be to diagnose cases as amœbic, nevertheless in some cases at Wellington "the evidence was strong that they were infected by meals on the railway journey."

*Beri-beri*.—There were diagnosed 33 cases, with no deaths! There were sporadic cases in various regiments.

*Heatstroke and Sunstroke*.—350 admissions and only 45 deaths, and this included the troop-train tragedy with 136 cases and 19 deaths. Ferozepore had 82 cases with 1 death, and Pindi 46 cases and no death. Most of these have been mild attacks.

*Tubercle of lungs*.—114 admissions and 11 deaths.

*Scarlet fever*.—An epidemic of 60 cases at Wellington on arrival of a draft of 2-4th Devons from England.

#### INDIAN ARMY.

Death-rate low, 8.9 per mille, with an invaliding rate of 24.5 per mille of strength. Malaria was the main cause of sickness and pneumonia of death (37 per cent. of all causes of death). An increased number of cases were diagnosed as enteric fever, the admission-rate being 2.4; anti-inoculation statements are not available.

*Sandfly fever*.—The Gurkha recruit was found to be very susceptible.

*Pneumonia*.—Caused 2,357 admissions and 466 deaths. The report gives no indication of the cause of this prevalence, which is so often associated with overcrowding and defective ventilation.

*Dysentery*.—Here again we find a preference for the amœbic type, "though the bacillary type was also present."

*Venereal diseases*.—There has been a marked increase in admissions for these complaints in the last two years, due largely to obvious war conditions, as stated in the Report.

*Tubercle of lungs*.—Little change in incidence; as usual, the Gurkhas suffer most as Chart IV of the report graphically shows. The steady decrease in the incidence of tubercle among the Gurkhas is satisfactory, but no attempt at an explanation is vouchsafed in the Report.

*Guineaworm*.—The following note agrees with our personal experience (formed over 28 years ago):—

"During the year there were 573 cases admitted to hospital, the ratio per 1,000 being 4.1. The records for the past few years show that certain garrisons, notably Poona, Lahore and Bannu, were principally affected. The sepoy becomes infected while on leave in an endemic area, and the statistics of the military cantonment, which draws its units from that area, suffer in consequence. There are parts of the Deccan where, at certain seasons of the year, nearly half the civil population suffer from this disease. This explains the number of admissions in Poona. It is noteworthy

that, while the disease is trivial in itself, cure is often delayed, necessitating a prolonged stay in hospital."

The following note on an outbreak of *beri-beri* on the troops of the Nepalese contingent is worth reproducing:—

"The disease affected 124 men of the first four battalions shown in the above regimental table; the Sabuz battalion suffered most, and the sick therefrom account for nearly three-quarters of all the cases. The manifestations of the disease had to be carefully looked for, as they were mild in the majority of cases. The day's dietary was found to consist of a large quantity of 'polished' rice, a fair supply of dhal, no fresh vegetables except one small potato per man, and an altogether insufficient quantity of salt, ghi and condiments. Meat was issued once a week only, and the supply of this was insufficient, as there was difficulty in obtaining it. The Nepalese are, by their religion, prohibited from eating the flesh of any animal other than that of the male goat. There was also an objection to eating 'cured' rice, but this with a little persuasion was overridden.

"A new diet was introduced, sufficient in nitrogen and vitamins, with the result that no further cases occurred."

#### PRISONERS.

The average strength of prisoners in 1916 was the *highest ever recorded*, viz., 114,083, but the sick and death-rate only very slightly increased. The chief causes of sickness were malaria 153 per mille, and dysentery 60 per mille; but the most important causes of death were tubercle of lungs 3·3, dysentery 3·0 and pneumonia 2·6; one death in every six was recorded as due to phthisis, a disease which 30 years ago was stupidly said to be rare in India!

The Andamans had 12,559 prisoners, but the death-rate was for those islands low, viz., 34 per mille. We note that three cases of blackwater fever, one fatal, were reported from the Andamans.

#### LUNATIC ASYLUMS.

The lunatic asylums continue to be the Cinderellas of Indian medical administration. There are 21 asylums of sorts in India, the small Presidency of Bombay having six. The total asylum population of India was only 9,547, about 2,500 patients having been admitted or readmitted during the year. The health is said to have been "satisfactory" (663 deaths out of an average strength of 9,547 patients)—the latest news is the still further postponement of the Ranchi Native Asylum. The All-India European Asylum at Ranchi is now open.

### Medical Society.

#### BOMBAY WAR HOSPITALS MEDICAL SOCIETY.

This Society was inaugurated on February 8, 1918, at a meeting convened by the officiating A.D.M.S., Bombay Brigade, Colonel D. J. Collins,

A.M.S., and held at the Bombay Bacteriological Laboratory, Parel. The formation of the Society was approved and officers elected as follows:—

*President*—Col. W. G. Beyts, A.M.S., A.D.M.S., Bombay Brigade.

*Vice-Presidents*—Col. A. M. Sheen, A.M.S. (T.F.), Consulting Surgeon, Southern Command; Col. C. H. L. Meyer, I.M.S., Consulting Physician, Southern Command.

*Hon. Secretary and Treasurer*—Capt. W. Macadam, R.A.M.C.

*Committee*—Lieut.-Col. W. Glen Liston, C.I.E., I.M.S.; Capt. S. D. Dykes, R.A.M.C.; Capt. D. L. Sewell, R.A.M.C.; Capt. S. K. Engineer, I.M.S. Asst. Surgeon E. C. R. Fox, I.S.M.D.

Those eligible as members to be all medical officers, assistant surgeons and sub-assistant surgeons on military duty in Bombay. Those similarly doing duty at the Poona and Deolali War Hospitals to be honorary members and all naval and military medical officers passing through Bombay to be admissible as visitors. The time and usual place of meeting to be 5-30 P.M., on the last Thursday of each month at the Gerard Freeman Thomas War Hospital.

Following the business meeting an interesting demonstration was given by Col. Liston and the Staff of the Bombay Bacteriological Laboratory on the work there in progress, and a paper, illustrated by lantern slides, was read by Dr. Soparkar on "Schistosomiasis, with special reference to the possibility of its introduction into India." A vote of thanks to the Parel Staff concluded the proceedings. The members were kindly entertained to tea by Col. and Mrs. Liston during the meeting.

The second meeting of the Society was held at the Freeman Thomas Hospital on February 28, Col. Sheen in the chair. Seventy-one members and visitors were present. Lieut.-Col. Novis, I.M.S., showed a case of arthritis of the wrist with marked rarefaction of the bones. Major H. S. Hutchison, I.M.S., showed (1) a case of functional paralysis of the tongue. The movements of the tongue in the mouth were good but it could not be protruded; and (2) a case of Colles' fracture where in spite of remarkable deformity there was good functional result. Col. Sheen showed (for Major Gilder) a case of malunited fracture (Colles') in which forcible rectification under an anæsthetic had been followed by immediate return of movement in the fingers.

Lady Doctor Davies showed (with skiagram) a case of partial transverse fracture of the patella without symptoms. The man went on playing football for 20 minutes after the injury.

Capt. Macadam demonstrated specimens (1) from a case of African trypanosomiasis, and (2) showing the histology of a Baghdad boil, which much resembled epithelioma.

Various members present discussed the cases.

The third meeting was held at the Colaba War Hospital on March 28, Col. Sheen in the chair.

Forty-five members were present. The meeting was an "X-ray evening" arranged by Captains Shorten and Barnard in charge of the department. Special series were shown illustrating diseases of the chest, injuries to bones, cranial radiographs, and results of bismuth meals. A number of stereoscopic radiograms were also shown. A case of Hodgkin's disease was shown by Lieut. Wright and a case of cutaneous nodules without ulceration shown pathologically to be leishmaniasis by Major Row.

Capt. Shorten gave a short account with demonstration of the new method of connecting a Coolidge tube, devised by himself and Capt. Barnard, the negative poles of the coil and the tube being connected with earth.

Pathological specimens were shown by Asst. Surgeon Menezes.

Discussions took place on the various items.

The fourth meeting was held at the Freeman Thomas Hospital on April 25, Col. Beyts, A.M.S., in the chair. The following cases were shown: (1) A case of Pott's fracture in which the fibula had been plated with good functional result by Lieut.-Col. Novis. (2) A case of abnormality of the genitalia by Major H. S. Hutchison, I.M.S. (3) Cases of œdema of the legs—filariasis or ankylostomiasis. (4) Hepatic enlargement, probably syphilitic. (5) Parotid fistula, all by Lieut. Pestonji, I.M.S. (6) A case of splenomegaly with jaundice, probably malarial, by Capt. Moran.

Discussions took place.

Major Row read a paper, illustrated by lantern slides on "The intensive culture of malarial blood in the diagnosis of kala-azar."

The fifth meeting was held at the Freeman Thomas Hospital on May 30, Col. Sheen in the chair. Thirty-one members were present. Capt. Macadam resigned his post of Hon. Secretary as he is leaving Bombay and he received a hearty vote of thanks for the work he had done. Major H. S. Hutchison, I.M.S., was elected to succeed him.

Capt. Moynan, R.A.M.C., showed a case of Brown-Sequard paralysis: There was a history of spinal injury two years previously, but the connection with the present condition was obscure. Capt. Moynan also showed a case of pseudo-hypertrophic paralysis in a man of 30. The age and the absence of family history were points of interest. Capt. S. K. Engineer showed a painting and photograph of a case of a huge aneurysm of the descending thoracic aorta. The heart was at first pushed forward but as the aneurysm grew larger and projected through the left chest behind, the heart receded.

Major Row showed a case of ascites in which, after failure of repeated tapplings, a cure apparently resulted after subcutaneous injection of ascitic fluid.

Col. Sheen (for Lieut. Pestonji, I.M.S.) showed a case of a bullet wound involving the circumflex nerve alone.

Interesting discussions took place on the various cases.

## Correspondence.

### RATS AND PLAGUE.

To the Editor of the INDIAN MEDICAL GAZETTE.

SIR,—In view of the great increase of epidemic plague of late, a theory I formed and on which I acted successfully in actual practice in C Ward (the Market) Bombay city when I was there on plague duty (period 1900-02 nearly two years) may be of interest.

I went to Bombay city on plague duty from similar duty in Aden in the commencement of 1900 and was appointed to the charge of C Ward (the Market).

The plague epidemic for the year (1899-1900) was practically at an end, although however there were cases of plague during the rest of the year between the annual epidemics.

I noticed however next year (1900-01) that the plague epidemic commenced later than its predecessor by about one month. I found on reference to the records in my office at Pydhonie and to the medical officers of C Ward, viz., doctors Bardi, Britto and Gimi and Mr. Cama, that the plague epidemic had a tendency to be about a month later every year in commencing and I formed the theory that the cycle of return of epidemic plague was about thirteen (13) months.

Acting on this theory, in anticipation of the plague epidemic of 1901-02 I began about the eleventh (11th) month after the commencement of the previous (1900-01) epidemic to evacuate some of the worst chawls (tenement buildings) as an experimental measure, with the consent of the landlords, and transferred the residents to the health camps in the ward. These chawls were then thoroughly disinfected with perchloride of mercury solution (strength 1 in 1000) and when dry were lime-washed, and then the residents were transported back to their respective abodes.

The result was that during the ensuing plague epidemic (1901-02), which commenced, as I expected, about thirteen (13) months after the previous epidemic, the chawls so treated had very few plague cases, instead of a large number as was usually the case.

I was unable to pursue my investigations any further as the period of plague duty for, as far as I know, all military combatant officers in Bombay terminated on the 31st March, 1902, and the Health Department took over the plague work.

I made a note of the above theory in my Annual Ward Report for 1901-02 but do not know if it was incorporated in the Bombay Municipal Commissioner's Annual Report for that year.

It would be, I think, a matter of interest if the Bombay city plague records could be examined with a view to verifying my theory.

For some years after I returned to military duty I used to see each year in the newspapers remarks somewhat to this effect.

"This time last year plague had commenced but no cases have been reported to date this year, so we may hope that there will be no recurrence of plague."

Then after an interval of time the reports of the mortality from plague in the different presidencies and provinces in India would be printed in the *Indian Medical Gazette*, thus partially confirming my theory.

I was particularly struck some months ago by a report on plague which appeared in the Calcutta newspapers to the effect that it was thirteen (13) years since plague had been so severe.

I write to you in the hope that you will consider this letter of sufficient importance to publish in your columns, so that if my theory is verified it will be of assistance in combating recurring plague epidemics in densely populated centres.

Yours, etc.,  
O. A. SMITH, MAJOR (Retd.),  
Indian Army.

### RESULTS OF TARTAR EMETIC TREATMENT IN MALARIA AND KALA-AZAR IN THE TAHERPUR RAJ CHARITABLE DISPENSARY.

To the Editor of the "INDIAN MEDICAL GAZETTE."

SIR,—I beg to send you notes of the several cases of kala-azar and malaria treated in this dispensary by the



intravenous injection of tartar emetic, for insertion in your valuable gazette.

By the kind suggestion of the Civil Surgeon of Rajshahi, I commenced from January, 1918, to treat several cases of chronic malaria and kala-azar by the intravenous injection of tartar emetic. Up to May, 19 cases were treated by this method, and a summary of a few of them are given below. The cases were diagnosed by their clinical feature as no microscope was available and blood examination was not possible. The injections were given twice weekly beginning with  $\frac{1}{4}$  c.c. of a 2 per cent. solution of tartar emetic and increasing the dose by  $\frac{1}{4}$  c.c. at each dose until 4 c.c. was reached. When the maximum dose 4 c.c. was reached several injections of 4 c.c. per dose were given. I could not increase the dose according to the suggestion of Sir Leonard Rogers, published in the Indian Medical Gazette of 1917, owing to the small calibre of my syringe.

Most of the injections were made into the median basilic vein at the bend of the elbow. Several injections were also made into a vein at the back of the hand.

**Technique adopted in the injection.**—A string is tied round the arm. The arm is stretched over a pillow (the patient lying down). The needle is plunged into the vein; when vein is pierced a stream of blood flows into the syringe. The needle is then pushed a little further into the vein. If the blood still continues to flow into the syringe, the piston is gradually pressed after having loosened the string tied round the arm.

I supplemented the intravenous injection of tartar emetic by giving the following drug by the mouth:—

|                  |     |     |         |
|------------------|-----|-----|---------|
| R                |     |     |         |
| Antimony tart.   | ... | ... | gr. i   |
| Acid tannic      | ... | ... | gr. iii |
| Sodi bicarb.     | ... | ... | gr. v   |
| Mis. F., pulv 1. |     |     |         |

**Results.**—Of the 19 patients, 13 were discharged as cured after fever had been absent for 1 to 2 months. Six patients still undergoing treatment, though they have improved considerably. Nearly all of them were hopeless cases before the treatment, on account of the uncontrollable pyrexia, profound anaemia, great emaciation and enormous enlargement of the spleen and liver. But under the intravenous injection of tartar emetic strikingly excellent result was noticed in all of them. The patients now appear to be in perfect health, presenting a robust appearance.

#### SUMMARY OF CASES.

1. S. Karmakar, Hindu, male, aged 30 years, of Taherpur. Suffering from low fever, ranging from 99° to 100° F., for nearly 3 years.

**Spleen.**—Extending midway between the umbilicus and the left costal arch.

**Liver.**—Enlarged. Very weak, anæmic.

**Treatment and result.**—10 injections of a 2 per cent. solution were administered. Temperature came to normal after 4th injection. Spleen disappeared beneath the ribs, body weight increased, and the patient looks robust and healthy.

2. S. Dass, Hindu, male, aged 13 years, of Gopalpara, Taherpur. Suffering from daily double rise of temperature for nearly 3 years. Very emaciated, weak and anæmic. Fever was not checked by quinine.

**Spleen.**—Extending to a point about midway between the umbilicus and the left anterior sup. iliac spine and at the level of the umbilicus extending to about 3 inches to the right of the middle line.

**Liver.**—Enlarged.

**Treatment and result.**—17 injections were administered. Temperature came to normal after 7th injection. The splenic enlargement nearly disappeared. Decided increase of body weight, no anaemia. The patient appeared to be in perfect health, presenting a robust appearance.

3. Anaruddi, aged 28 years, Mohammadan, male, of Ujalkhalsi, Rajshahi. Suffering from malarial fever for nearly 3 years. Emaciated and anæmic.

**Spleen.**—Extending beyond the navel.

**Treatment and result.**—10 injections were administered. Temperature came to normal after 6th injection. Spleen diminished in size, anaemia less marked; patient discontinued treatment.

4. Asiruddi, aged 18 years, Mohammadan, male, of Kamarkhali, P. S. Bagmara, Rajshahi. Suffering from daily double rise of temperature ranging from 100° to 103° F. for nearly 2 years. No intermission during the last six months. Very emaciated and anæmic. Quinine fails to check the fever.

**Spleen.**—Extending beyond the navel.

**Liver.**—Enlarged.

**Treatment and result.**—18 injections were administered. Temperature came to normal after 8th injection. Body weight increased, splenic enlargement disappeared. The patient looks perfectly healthy.

5. Srinath, aged 36 years, Mohammadan, male, of Gopalpara, P. S. Durgapur, Rajshahi. Suffering from daily double rise of temperature for nearly 3 years. No intermission during the last 8 months. Emaciated and anæmic. Quinine fails to check the fever.

**Spleen.**—Extending beyond the navel.

**Liver.**—Enlarged.

**Treatment and result.**—9 injections were administered. Temperature controlled after 6th injection. General health improved considerably and splenic enlargement diminished. Still undergoing treatment.

6. Rajal, aged 15 years, Mohammadan, male, of Maul, P. S. Durgapur, Rajshahi.

Suffering from fever for nearly 4 years, weak and anæmic.

**Spleen.**—Extending beyond the navel.

**Liver.**—Enlarged.

**Treatment and result.**—10 injections were administered. Temperature came to normal after 4th injection; general health improved, body weight increased, spleen disappeared beneath the ribs.

7. Hobir, aged 26 years, Mohammadan, male, of Alipur Maul, P. S. Bagmara, Rajshahi.

Suffering from fever for nearly 3 years. The fever was ushered in with rigor; weak, emaciated and anæmic.

**Spleen.**—Extending beyond the navel.

**Liver.**—Enlarged.

**Treatment and result.**—8 injections were administered. Temperature came to normal after 4th injection; general health much improved. Splenic enlargement diminished considerably. The patient went home and so discontinued treatment.

The remaining cases were of like nature.

Yours, etc.,

TAHERPUR, } BAMA CHARAN KHAN, L.M.P.,  
RAJSHAHI. } SUB-ASSISTANT SURGEON,  
Medical officer, Taherpur  
Raj Charitable Dispensary.

#### RADISHES IN DROPSY.

To The Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I crave permission to kindly allot some space in your valuable journal to the following, which would be of some use to the profession.

In the Indian Medical Gazette for February, 1918, at page 75, there is given a detailed effect of the use of some radishes in dropsy by Mr. Sen.

As described by Mr. Sen and his patient, the radishes seem wonderful in their effects. It is therefore presumed that the "radishes" must be popular in Mr. Sen's province inasmuch as they are known by all there. But, alas! Mr. Sen seems to forget that the reverse should be the case with the profession in other provinces of India. Mr. Sen is therefore requested to give, through the medium of this journal, a description of this "radish" together with its botanical name, and, if possible, with the names it goes by in the different provinces of India (i.e., in Hindi, Marathi, Gujarati, etc.) as without this and like information about such an useful "radish" I think certainly it is of no use to the profession outside Mr. Sen's province, where people do not know what "radish" is?

Just while reading about radish in this issue of the journal I had a patient by my side for dropsy whom I was sorry I could not advise to try radish treatment without knowledge of the Gujarati name for it, and which has compelled me to trouble Mr. Sen with this—in the interest of some other professional brothers.

DISPENSARY CHIKHLI,  
DISTRICT SURAT,  
14th June, 1918.

Yours, etc.,  
D. S. PATEL,  
Sub-Assistant Surgeon.

[This is a rather silly letter. The radish is a well-known vegetable everywhere.—ED., I. M. G.]

#### A CASE OF ECLAMPSIA.

To The Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The following case of eclampsia successfully treated with morphia and pituitrin is perhaps worth publishing:—

A female, aged 20 years, primipara, apparently in good health, 9 months' pregnancy with history of bad constipation, and passing abnormally small quantities of urine, was attacked with eclampsia. The attack began with convulsions of the face and then the extremities, jaws were tightly clenched, and when I saw the patient (on 19th February, 1918, 8-30 A.M.), she was comatose. Two-thirds of a grain of morphia was given hypodermically at once. Urine was drawn by a catheter, half an ounce in quantity. Soap and warm water enema was given next, with the result that a large quantity of hard



fecal matter was removed. There was no improvement; at 12 noon heart was weak, and it was decided to terminate the pregnancy artificially, in consultation with another Sub-Assistant Surgeon (P. Sanyasi Rau) who happened to be in Rayachoti on business.

As I was not in possession of dilators, I had to rely on the action of pituitrin (P. D. and Co.), and from the gravity of the case determined to give even large doses and accordingly 1 c.c. of pituitrin was given hypodermically; and she delivered a dead male child at 2 P.M. The bleeding was excessive and pulse very feeble, so another 0.5 c.c. of pituitrin was given hypodermically. Within half an hour she improved considerably, her pulse became strong and bounding. Bleeding stopped and a large quantity of urine was passed, but still comatose.

On the recurrence of convulsions—

|                       |     |     |         |             |
|-----------------------|-----|-----|---------|-------------|
| 1. Morphine           | ... | ... | 1/3 gr. | } at 5 P.M. |
| Atropine              | ... | ... | 1/200 " |             |
| 2. Morphine           | ... | ... | 1/3 "   | } at 8 P.M. |
| Atropine              | ... | ... | 1/200 " |             |
| Hyoscine hydrobromide | ... | ... | 1/200 " |             |

were given hypodermically and the rest of the night passed without any convulsions.

20th February 1918.—Still comatose, convulsions slight, urine was being passed in large quantities, when—

|                       |     |     |         |
|-----------------------|-----|-----|---------|
| Morphine              | ... | ... | 1/3 gr. |
| Hyoscine hydrobromide | ... | ... | 1/200 " |

was given hypodermically, followed by soap and warm-water enema.

By the evening when I saw her (at 7 P.M.), her pulse was weak, urine stopped for the last 6 hours; so I had to give pituitrin 0.25 c.c. hypodermically. No convulsions but still comatose.

21st February 1918.—Her conditions improved, could see, and jaws were relaxed. She was able to swallow fluids. Pulse again weak; so pituitrin 0.25 c.c. was given hypodermically and oleum ricini, 1 oz., by mouth.

From 20th February, 1918, she was all right, and oleum ricini was continued 4 days more, and the recovery was uneventful.

Pituitrin caused premature labour in 2 hours and acted as a strong diuretic, thus eliminating toxins. This is of great help to practitioners in the mofussil, where the resources are little.

Yours, etc.,

S. SREEMAN NARAYANA MURTHY,

Sub-Assistant Surgeon.

RAYACHOTI,

CUDDAPAH DISTRICT.

## THERAPEUTIC NOTICES.

MESSRS. MARTIN & HARRIS, of Calcutta, are advertising the well-known preparations of the firm Emil Scheller, of Zurich, a Swiss firm founded in 1877. Their ESCA SYRUP is a tonic syrup made up of Potassium Sulphoguaiculate (or Thioal), and the Hypophosphites of lime, soda and manganese, combined with pine tar, Virginian prime and other demulcents. It is specially recommended for catarrhs and colds.

MESSRS. PARKE DAVIS & Co. call attention to their soluble silver-proteid called SILVOL, used in all cases where a silver salt is applicable.

MESSRS. SMITH STANISTREET, & Co., of Calcutta, are the Sole Agents for TRIMETHOL, the non-toxic germicide.

MESSRS. MARTIN & HARRIS, 8, Waterloo Place, hold large quantities of Java quinine and quinine salts.

MESSRS. SKIPPERS & Co., Clive Street, Calcutta, are the Agents for the CELTOL Disinfectants.

## Service Notes.

A SCHOOL of Instruction for Temporary I.M.S. Officers was opened at Rawalpindi on May 1st, with Major C. Hudson, D.S.O., I.M.S., as Commandant, and Captain G. S. Brock, I.M.S., as Adjutant.

The School was inspected on the opening day by Surgeon-General P. Hehir, C.B., C.M.G., C.I.E. (D.D.M.S., Northern Command), and Colonel Heard, I.M.S., and an opening address was given by Surgeon-General Hehir to the officers attending the course.

The Scheme of Training to be carried out in the School as laid down in Army Instructions (India) No. 414—dated 30th April, 1918, is appended hereto. Practical Instruction is given by the C.O. of the Station Hospital, Lieutenant-Colonel Argles, R.A.M.C.; by the S.M.O., I.M.S., Lieutenant-Colonel Moore, I.M.S., and lectures are delivered by specialists in Sanitation, Surgery, etc. Also lectures and practical demonstrations are being given by the D. A. D. M. S. (Sanitary) and the D. A. D. M. S. (Mobilization). And lectures on Military Organisation, Field Sketching, Map Reading, etc., by the General Staff or officers detailed by them.

Curriculum. The curriculum is roughly as follows:—Parade daily from 6.30–7.30 A.M., for Squad Drill and Stretcher Drill, and on two days a week for Physical Training. Lectures and practical work from 9 till 3 or 4.30 P.M.

A course of equitation (voluntary) was also arranged for, and this was attended by officers in the evenings, from 6.30–7.30.

(Copy.)

GOVERNMENT OF INDIA, ARMY DEPARTMENT.

ARMY INSTRUCTION (INDIA).

No. 414 of 1918.

SIMLA, 30th April, 1918.

414: SCHOOL OF INSTRUCTION FOR TEMPORARY OFFICERS OF THE INDIAN MEDICAL SERVICE.

It has been decided to establish at Rawalpindi for the remaining period of the War, a School for the Instruction of Temporary Officers of the Indian Medical Service. Details of the scheme are shown in the appendix to this order.

2. All expenditure connected with the School will be debited to His Majesty's Government through the Controller of War Accounts.

31048 (D. M. S.)  
D.

(Sd.) A. H. BINGLEY, MAJOR-GENERAL,

Secretary to the Government of India.

Appendix to Army Instruction (India) No. 414 of 1918.

SCHEME FOR THE FORMATION OF A SCHOOL OF INSTRUCTION AT RAWALPINDI FOR TEMPORARY OFFICERS OF THE INDIAN MEDICAL SERVICE.

(1) Location and Designation.—The School will be formed at Rawalpindi, and designated "School for Instruction of Temporary Officers, Indian Medical Service."

(2) Duration of Course.—There will be three sessions in the year—viz., 1st May to 31st July; 1st October to 31st December; and 15th January to 14th April.

(3) Size of the Class.—All Temporary Officers engaged in the future will join the School in the first instance. Those who have already been employed will undergo a course of instruction when they can be spared. 12 to 15 Officers of each category, will, it is anticipated, be available and each class will thus consist of 24 to 30 Officers.

(4) Accommodation.—The School will be accommodated in B. P. tents.

(5) Pay and Allowances of Officers while under training.—Pay admissible under contract while serving in India, with detention allowance at the rate of Rs. 5 per diem for the first 30 days of the course, and at the rate of Rs. 3.30 per diem for a further period of 12 days. The detention allowance will not be admissible for any days for which travelling allowance is drawn.

(6) *Syllabus.*—

- Drill and physical exercises.
- Discipline.
- Medical organisation in military hospitals in peace.
- Principles governing medical charge of troops.
- Duties of medical officers in connection with effective charge of troops in quarters, camps, etc.
- Military organisation.
- Practical work in military hospitals.
- Army Regulations, India, Volume VI; Army Tables, Medical.
- Army Regulations, India, Volumes II, III, I, Medical and Sanitary paragraphs.
- Special orders and circulars concerning medical services.
- Examination and passing of recruits.
- Invaliding of soldiers.
- Supervision and training of recruits.
- Medical organisation in war. Equipment and composition of medical units.
- Mobilisation and demobilisation of field medical units: tent pitching: preparation to receive and despatch wounded.
- Work of regimental medical officers and of medical units in the field.
- Demonstration in connection with the three preceding items.
- Principles of tactics.
- Map-reading and field-sketching.
- Regimental staff tours—duty of medical services.
- R. A. M. C. training:—
  - F. S. Regs., parts 1 and 2.
  - F. S. Manual, medical, India.
  - Medical, manual, war, India.
  - Medical training (military), India.
  - Training and manoeuvre regs.
  - Mobilisation and concentration regs.
- Military medicine, including tropical medicine.
- Clinical demonstrations—to include subject of inoculation against infectious diseases in India: Enteric, paratyphoid, cholera, and plague.
- Military surgery and X-ray work.
- Clinical demonstrations.
- Military hygiene (in peace and war).
- Practical sanitation and demonstrations in the divisional laboratory.
- Special lectures and demonstrations:—
  - Venereal disease.
  - Skin do.
  - Eye do.
  - Ear do.
  - Physical training.
  - Equitation (to be entirely voluntary).

At the conclusion of each session the class will visit the War Hospital and Mayo Hospital at Lahore, and the hospitals and other medical institutions at Dehra Dun. On completion of the course officers will join the appointments to which posted.

(7) *Equipment.*—A sum of Rs. 1,500 is allotted for the purchase of the equipment noted below:—

Three microscopes with all accessories for carrying out general, clinical, bacteriological and haematological examinations. Magic lantern and screen. Cabinet of slides of tropical disease, Urinometers, Blackboards, Diagrams, etc.

For the maintenance of this equipment and purchase of such additional equipment as may be required a sum of Rs. 375 per annum will be allowed.

For the provision of a library containing books of reference an allotment of Rs. 600 initial and Rs. 150 per annum recurring is authorised.

(8) *Staff.*—The following staff is authorised throughout the year:—

- 1 Commandant (Lieutenant-Colonel or Major, Indian Medical Service), on a staff pay of Rs. 200 per mensem in addition to grade pay. When the Commandant is a Lieutenant-Colonel his emoluments will not be less than Rs. 1,250 per mensem.
- 1 Adjutant (Captain, Indian Medical Service), on a staff pay of Rs. 100 per mensem in addition to grade pay.
- 1 Drill Sergeant, with extra duty pay at Rs. 15 per mensem.
- 1 Soldier Clerk, with extra duty pay at Rs. 10 per mensem.
- 1 Chaprassi, at Rs. 9 per mensem.

(9) *Office Allowance.*—Rs. 25 per mensem will be allowed for the period during which the classes will be held.

The casualties among officers reported during the fourteen days, 10th to 23rd April, 1918, inclusive, reached the very high total of 5,261, the largest number reported in two weeks since the war began. These casualties, of course, are from battles of the Picardy and Flanders, which have now lasted for a month. The very large number of 1,425 were reported as missing. Most of these, no doubt, are prisoners, though some must have been killed, and a few have probably rejoined. They may be tabulated as follows:—

|           |     |     |       |
|-----------|-----|-----|-------|
| Killed    | ... | ... | 1,038 |
| Died      | ... | ... | 13    |
| Wounded   | ... | ... | 2,729 |
| Missing   | ... | ... | 1,425 |
| Prisoners | ... | ... | 56    |

TOTAL ... 5,261.

The number of casualties among medical officers reached almost a hundred, also the biggest figures yet recorded. The names are given below. All, unless otherwise stated, are temporary officers of the R. A. M. C.

*Killed.*—Lieutenant-Colonel H. Stewart (regular); Major J. S. Wallace (T. F.); Captains D. C. Coole, C. G. H. Philip, D. W. Hunter, D.S.O., R. H. Thomas, J. Carmichael (Canadians), C. E. A. Wilson, G. H. D. Webb, W. Bravallie, S. E. McClatchey, H. W. Batchelor, A. L. Gardner, J. Mackenzie, D. Mackinnon, and E. Robinson, L.D.S., Canadian Cavalry.

*Drowned.*—Surgeon A. F. Macintosh, R.N.

*Died.*—Captain W. Turner.

*Wounded and missing.*—Captains T. E. Townsend and E. E. Mather.

*Wounded.*—Majors G. E. Ferguson (regular), B. F. Bartlett, C. B. Davies, M.C., and R. F. Craig (Australians); Captains C. D. S. Agassiz, M.C. (T. F.), S. W. Fisk, C. H. S. Redmond (T. F.), W. J. Seale, M.C., J. W. Hagey (Canadians), R. O. B. Briscoe, P. Forbes, A. W. Gill, M. B. Graham, M.C. (S. R.), W. A. Hislop, T. M. Dane, M.C. (S. R.), A. W. Forrest, C. M. Gozney, M.C. (T. F.), H. F. H. Eberts, F. M. Stewart, M.C., C. Jacobs, M.C. (T. F.), A. Merrin, B. J. Mullin, M.C., L. A. Celestin, A. C. Hancock, M.C., G. W. B. James, A. Ball, T. F. Corkill, M.C. (S. R.), J. Manuel, M.C., P. F. McLachlan, M.C., H. G. Pesel, A. H. Webster, E. E. Isaac, M.C., A. W. Berry, P. A. Creux, W. H. N. White (T. F.), T. G. Allen (Australians), R. Kenefick, G. L. Pillans, M.C., J. A. Tomb (T. F.), D. Dempster, and S. P. Hodgkinson; Lieutenants A. E. Sanders, D. T. Harris, A. H. Southam, and G. M. Groves; and Sister M. E. Patterson (Canadians).

*Missing.*—Major J. Kennedy (S. R.); Captains F. T. H. Davies, H. S. Moore, A. C. Hepburn, P. A. Green, J. A. Gilfillan, W. J. Hirst (T. F.), C. E. Redman, E. A. Walker, M.C., J. C. Muir, S. Smith, M.C., R. M. Soames, F. Dallimore, M.C., J. B. Ball, A. J. Chillingworth, S. J. Dake, M.C., R. R. Duncan, J. P. Thierens, A. C. Bateman, M.C. (S. R.), J. G. Anderson (T. F.), H. B. Jones, W. H. R. McCarter, R. A. Leembruggen, J. Tate, J. W. Evatt (regular), D. F. Terrens, and L. C. Maclean, D.S.O.; and Lieutenant F. N. P. Maitland.

*Prisoners of War.*—Captain J. C. Muir, T. W. Leighton, W. O'Brien, and D. M. Spring (T. F.).

Surgeon Alexander Fraser Macintosh, R.N., was reported as accidentally drowned, in the casualty list published on 11th April, 1918. He was educated at Glasgow University, where he graduated as M.B. and Ch.B. in 1915, and soon after took a temporary commission in the Navy.

Captain Douglas William Hunter, D.S.O., R.A.M.C., was killed in action on 25th March, 1918. He was the eldest son of Douglas Hunter, Esq., of Jordonhill, Glasgow, and was educated at Glasgow University, where he graduated as M.B. and Ch.B. in 1901, subsequently taking the D.P.H. Cambridge in 1907. He was in practice at Bradford till he took a temporary commission as Lieutenant in the R.A.M.C. on 10th October, 1914. He was promoted to Captain after a year's service, received the D.S.O. on 26th September, 1916, and was attached to the West Yorkshire Regiment when killed.

Captain Charles Edgar Andrew Wilson, R.A.M.C., died of wounds on 8th April, 1918, aged 41. He was the eldest son of the late Revd. A. Wilson, Rector of Bedford Park, Chiswick, and was educated at Chesterhouse, at St. Thomas's Hospital, and at Christchurch College, Oxford, where he graduated as B.A., with first class honours in Physiology in 1899, and as M.B. and B.Ch. in 1902. After filling the posts of House Surgeon to the Hospital for Sick Children, Great

Ormond Street, London, of House Surgeon to the General Hospital, Birmingham, and of Honorary Surgeon to the Blackheath and Charlton Cottage Hospital, he went into practice at Petworth, Sussex, where he was Medical Officer and Public Vaccinator to the Tollington district of Midhurst Union, and Honorary Surgeon to the Petworth Cottage Hospital. He took a temporary commission as Lieutenant in the R.A.M.C. in 1916, was promoted to Captain after a year's service, and had been at the front almost ever since. All of his brothers, Lieutenant Harold Cobbe Wilson, Middlesex Regiment, was killed at Spion Kop in South Africa; a Second Lieutenant Lawrence Trench Wilson, R.G.A., was killed in France in 1915, and two others are still serving.

Deputy Surgeon-General James Henry Loch, Bengal Medical Service, retired, died at Guildford on 9th April, 1918, aged 85. He was the son of Rear-Admiral Loch, was born on 21st September, 1832, and educated at Edinburgh University, where he graduated as M.D. in 1853. Entering the I.M.S. as Assistant Surgeon on 20th December, 1854, he became Surgeon on 20th December, 1866, Surgeon-Major on 1st July, 1873, Brigade Surgeon, when that rank was first instituted, on 27th November, 1879, and D.S.G. on 1st January, 1884, retiring on 1st January, 1889. He served in the Indian Mutiny in 1857-58, in the operations of the Oudh Field Force, January to June, 1858, taking part in the relief of Azimgarh and the pursuit of Koer Singh, and received the medal.

Major Joseph Stephen Wallace, M.C., R.A.M.C. (T.F.), was killed in action on 28th March, 1918. He was the eldest and last surviving son of Joseph Wallace, of Portland Place, London, W., and was educated at University College School and Hospital, qualifying as M.R.C.S. and L.R.C.P. London in 1915. After acting as House Surgeon of the Great Northern Central Hospital, he took a commission as Lieutenant in the R.A.M.C. (T.F.), went to France in July, 1915, and, except for two weeks' leave, had been at the front ever since. He was promoted to Captain after six months' service, and was gazetted to be Acting Major from 20th March, 1918, a few days before his death, though the promotion was not gazetted till some three weeks after his death. He was twice mentioned in despatches, gained the Military Cross on 26th July, 1917, and a Bar thereto on 4th February, 1918.

Captain Solomon Cross, R.A.M.C., was killed in action on 22nd March, 1918, having previously been reported wounded. He was the youngest son of Mr. W. Cross of Darlington, and was educated at the Royal Keper Grammar School, Houghton-le-Spring, where he gained the Heath Scholarship, and at Durham University, where he graduated as M.B. and B.S. with honours in 1899. After acting as House Surgeon to the Brighton and Sussex County Throat and Ear Hospital, and practising for a short time at Houghton-le-Spring, he moved to New Castle, where he held the appointments of Assistant Surgeon to the Throat and Ear Hospital, and to the New Castle Hospital for Women, and of Anaesthetist to the New Castle Dental Hospital. He took temporary commission as Lieutenant in the R.A.M.C. towards the end of 1915, and was promoted to Captain after a year's service.

Captain William Turner, R.A.M.C., died recently of pneumonia on active service. He was educated at St. Mungo's College, Glasgow, and took the Scottish triple qualification in 1900, after which he went to practice at Saltcoats, Ardrossan, Ayrshire, where he was Medical Officer of Old Ardrossan Parish. He took a temporary commission as Lieutenant in the R.A.M.C. about two years ago, was promoted to Captain on completion of a year's service, and had served on both the Eastern and Western fronts.

Edwin Robinson, L.D.S., Canadian Cavalry, was killed in action on 31st March, 1918. He was the youngest son of the late John Robinson, of South Shields, and was educated at Edinburgh, where he took the L.D.S. of the Edinburgh College of Surgeons in 1897, and at Pennsylvania University, where he graduated as D.D.S. in 1898. He was for many years in practice in Melville Street, Edinburgh, but had retired some time ago.

Captain Alfred Linton Gardner, R.A.M.C., was killed in action on 10th April, 1918, aged 36. He was educated at Gny's Hospital, took the M.R.C.S. and L.R.C.P., London in 1912, and after acting as Assistant Medical Officer of Poplar and Stepney Sick Asylum, went into practice at Ilfracombe, Devonshire. He took a temporary commission as Lieutenant in the R.A.M.C. about two years ago, and was promoted to Captain after a year's service.

Lieutenant-Colonel Hugh Stewart, D.S.O., R.A.M.C., was killed in action on 12th April, 1918, aged 36. He was born on 15th April, 1881, the elder son of the late Captain Hugh Stewart, of Hatley, Foxrock, County Dublin, and was educated at Trinity College, Dublin, where he graduated as B.A., B.Ch., and B.A.O. in 1904. Entering the

R.A.M.C. as Lieutenant on 31st July, 1905, he became Captain on 31st January, 1909, Major on 15th October, 1915, and Acting Lieutenant-Colonel on 1st February, 1916. He received the D.S.O. on 3rd June, 1917.

Captain Duncan Mackinnon, R.A.M.C., died on 12th April, 1918, of wounds received that day. He was the youngest son of the late Professor Donald Mackinnon, of Edinburgh University and was educated at that University, where he graduated as M.B. and Ch.B. in 1900. He held a temporary commission in the R.A.M.C.

Captain J. Mackenzie, R.A.M.C. (temporary), died of wounds on 10th April. He was the eldest son of the late K. P. Mackenzie of Lochinver, Sutherlandshire, and was attached to the Durham Light Infantry.

THE casualties among officers reported during the fourteen days, 25th April to 7th May, 1918, inclusive, reached the very high total of 5,069. Of the large number shown as missing, many doubtless have been killed, and many taken prisoners. These casualties are tabulated as follows:—

|           |     |     |       |
|-----------|-----|-----|-------|
| Killed    | ... | ... | 1,044 |
| Died      | ... | ... | 21    |
| Wounded   | ... | ... | 2,840 |
| Missing   | ... | ... | 684   |
| Prisoners | ... | ... | 480   |
| Total     | ... | ... | 5,069 |

The number of casualties among medical officers reported was not far short of a hundred (ninety). The names are given below: all, unless otherwise stated, are temporary officers of the R.A.M.C.

*Killed and died of wounds.*—Surgeons H. N. Dale-Richards (R.N.) and R. W. Brander (R.N., accident); Major W. S. Garnett (Australians); Captains B. S. Browne, L. A. H. Bulkeley, A. L. Gardner, H. S. Palmer (T.F.), T. Fehily, H. E. Robinson, R. S. Kennedy, M.C., and I. K. F. MacLeod.

*Died.*—Captain H. E. Massy-Miles; Sister A. E. Whitcloy (Canadians); Nurses E. F. Barker (V.A.D.), and E. D. Pepper (V.A.D.)

*Wounded.*—Lieutenant-Colonels A. C. Rankin (Canadians), and A. L. C. Gilday (Canadians), Majors C. H. Davies, M.C.; W. T. Brown, M.C., T. W. Clarke, M.C. (S.R.), A. W. Rattrio, J. B. Lowe, and J. Purdie (S.R.); Brevet Major N. W. Stevens (regular, R.A.M.C.); Captains A. G. Cook, P. P. Freeman, M.C. (S.R.), C. H. Harbinson, J. Steel, F. W. White, R. H. C. Pryn, I. A. N. Scott, J. Smith, W. A. Troup, M.C., R. Donald, H. G. Oliver, M. R. Graham (Canadians), D. L. Kennedy (Canadians), G. Wilson (Canadians), M. Avent (S.R.), G. D. Latimer, T. Bennett, F. G. Forbes (S.R.), T. McEwen, M.C. (S.R.), A. R. Oram, C. G. Skinner, R. I. Sullivan, M.C. (S.R.), A. Malseed, M.C., A. F. L. Shields (S.R.), H. L. Gauntlett (T.F.), G. Fleming, J. G. Hill (T.F.), E. S. Cuthbert, P. R. Woodhouse, M.C., C. H. Leadman, M.C. (Australians), W. A. N. Fox (S.R.), G. T. MacLean, F. C. Harrison (S.R.), O. D. B. Mawson; Lieutenant G. L. Gall; Lieutenant and Quartermaster W. Gough.

*Wounded and missing.*—Captain R. D. MacGregor.

*Missing.*—Surgeons H. C. Broadhurst (R.N.), W. A. McKerrow (R.N.); Captains G. L. Jones (S.R.), F. P. Smith, W. F. Isherby, M.C., C. C. G. Gibson, A. H. Little (T.F.), A. G. Clark, S. A. Forbes, C. O'Malley, J. P. McVoy, H. W. White; Lieutenants J. F. Hornsey, E. S. Phillips.

*Prisoners of war.*—Captains A. G. Bisset, M.C., D. R. E. Roberts, H. A. Sandiford (T.F.), P. B. Corbett (S.R.), W. Warburton, H. Crasswellor, E. S. Griffin, D.S.O., M.C., J. Tato, A. T. I. MacDonald, R. W. Hodgsons-Jones, J. G. M. Molony, J. C. Muir, S. Smith, T. E. Carr; Lieutenant O. LeF. Milburn. Captain Griffin had previously been reported as killed.

Captain Llewelyn Alfred Henry Bulkeley, R.A.M.C., was killed in action on 10th April, 1918. He was the third son of the Revd. Canon H. J. Bulkeley, of Coddington, and was educated at Durham University, where he graduated as M.B. and B.S. in 1904. After serving as House Surgeon and House Physician of the Royal Infirmary at Newcastle-on-Tyne, and as House Surgeon of Darlington Hospital and Dispensary, he went into practice at Gateshead. He took a temporary commission as Lieutenant in the R.A.M.C. in the beginning of 1907, and was promoted to Captain after a year's service.

Captain John Carmichael, Canadian Army Medical Corps, was killed in action on 5th April, 1918. He was born at Collingwood, Ontario, in March, 1889, and educated at Queen's University, Kingston, Ontario, where he graduated

as M. D. and C. M. in 1915. He had served for two years in the Canadian Militia, 35th Battalion, and, after acting as Resident at the Western Hospital, Toronto, joined the Canadian A. M. C., and came to England in March 1916. After two months he proceeded to France, where he served successively in No. 2 and in No. 7 Canadian General Hospitals and later as a Regimental Medical Officer.

Captain Bernard Score Browne, R.A.M.C., was killed in action on 15th April, 1918. He was the son of Colonel A. Walker Browne, of Londonderry, and was educated at Edinburgh University, where he graduated as M. B. and Ch. B. in 1908. He then went out to China as a Medical Missionary of the Church Missionary Society, and also acted as Surgeon to the Chinese Customs Service at Ningpo, and received the Chinese Order of the Dragon. He took a temporary commission as Lieutenant in the R. A. M. C. on 2nd April, 1915, was promoted to Captain after a year's service, and received the Military Cross on 4th November, 1915.

Captain Hugh Salisbury Palmer, R.A.M.C. (T.F.), died of wounds on 25th April, 1918, aged 30. He was the younger son of the late C. A. Palmer, of Norwich, and was educated at Edinburgh University, where he graduated as M. B. and Ch. B. in 1914. He took a commission as Lieutenant in the 1st Home Counties (Maidstone) Field Ambulance on 10th November, 1914, and had subsequently served as Medical Officer of the 2nd Battalion, London Rifle Brigade and in the 2/2, Home Counties, Field Ambulance.

Surgeon Hedley Norman Dale-Richards, R.N., was reported as killed in action, in the casualty list published on 1st May, 1918. He was educated at St. Mary's Hospital, and graduated as B.Sc. London in 1912, and took the L.M.S. S. A. in 1917, after which he took a temporary commission in the Navy. He had held the posts of Joint Lecturer in Biology and Senior Demonstrator of Physiology in the Middlesex Hospital Medical School.

Surgeon Probationer W. C. Holdsworth, R.N.V.R., was reported as killed in the casualty list published on 1st May, 1918. He had previously been reported as "missing, presumed killed," in the loss of H. M. S. *Begonia* in October, 1917.

Surgeon Robert William Brander, R.N., died of accidental injuries at South Queensferry Naval Hospital on 1st May. He was the son of Mr. Brander, of Cupar-Fife, and was educated at Glasgow University, where he graduated as M. B. and Ch. B. in 1914, and served as Resident Assistant to the Regius Professor of Surgery till he took a temporary commission in the Navy.

Major W. S. Garnett, Australian Army Medical Corps, was reported as having died of wounds, in the casualty list published on 3rd May, 1918. He was reported as wounded in the list of 30th April.

Captain Thomas Joseph Felhly, R.A.M.C., was reported as killed in action, in the casualty list published on 3rd May, 1918. He was educated at Queen's College, Cork, and at the Medical School of the Royal College of Surgeons, Ireland, and took the Irish double qualification in 1908, and the D.P.H. of the R.C.S.I. in 1910. After serving as House Surgeon at Jervis-Street Hospital, Dublin, and as Assistant Medical Officer and Pathologist at the Devonshire County Asylum, Exminster, he became Assistant Medical Officer at the Lancashire County Asylum at Rainhill. He took a temporary commission as Lieutenant in the R.A.M.C. on 10th October, 1914, and was promoted to Captain after a year's service.

Captain Harry Godfrey Massy-Miles, R.A.M.C., died on service on 26th April, 1918, aged 32. He was the eldest son of the Revd. Canon J. H. Miles, of Teignmouth, and was educated in the Medical School of the Royal College of Surgeons, Ireland, taking the L. R. C. S. I., and L. R. C. P. I. in 1909. After acting as Extern Maternity Assistant at the Rotunda Hospital, Dublin, and as House Surgeon of Fernanagh County Hospital, he went into practice at Trafford Park, Manchester. He took a temporary commission as Lieutenant in the R. A. M. C. on 21st December, 1914, and was promoted to Captain on completion of a year's service.

Captain Henry Ellis Robinson, R.A.M.C., attached West Yorkshire Regiment, was killed in action on 26th April, 1918, aged 31. He was the fourth son of the Revd. E. C. Robinson, of Malvern, formerly of Hanbury, Staffordshire, and was educated at St. Bartholomew's Hospital taking the M.R.C.S. and L.R.C.P. London in 1915. After qualifying, he joined the R.A.M.C. as a Temporary Lieutenant, and was promoted to Captain after a year's service.

Captain Ronald Sinclair Kennedy, M.C., R.A.M.C., was reported as killed, in the casualty list published on 6th May, 1918. He was educated at Guy's Hospital, taking the M.R.C.S. and L.R.C.P. London in 1912, and at Cambridge, where he graduated as B.A., M.B., and B.C. in 1913, and as M.D. in 1917. After qualifying, he entered the service of the Egyptian Government, where he served as Surgeon to the Dazahlia

Provincial Ophthalmic Hospital and then as Inspector of Ankylostoma Hospitals. He took a temporary commission as Lieutenant in the R.A.M.C. in 1916, and was promoted to Captain after a year's service. He got the Military Cross on 26th September, 1917.

Captain Ian Keith, Falconer Macleod, R.A.M.C., was killed in action on 27th April, 1918. He was the only son of the Revd. D. J. Macleod, of the United Free Church Manse, Boddam, and was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1914. After acting as Resident House Surgeon in Edinburgh Royal Infirmary, he took a temporary commission as Lieutenant in the R.A.M.C. in 1915, and was promoted to Captain a year later.

Colonel Charles Fancourt Willis, C.B., Bombay Medical Service (retired), died at East Grinstead, Sussex, on 28th April, 1918, aged 63. He was born on 22nd May, 1854, and took the M.R.C.S. in 1875, the L.R.C.P. Ed. in 1877, the M.R.C.P. Ed. in 1882, the M.B. Durham in 1879, and the M.D. in 1887. Entering the I.M.S. as Surgeon on 31st October, 1879, he became Surgeon-Major on 31st October, 1891, Lieutenant-Colonel on 31st October, 1899, was placed on the selected list on 24th May, 1904, and promoted to Colonel on 14th November, 1908, retiring on 1st October, 1913. He was educated at Durham University and at St. Thomas' Hospital, and before entering the I.M.S. held the appointments of Clinical Assistant at the Royal London Ophthalmic Hospital and at New Castle-on-Tyne Eye Infirmary. He served in the Egyptian War of 1882, taking part in the battle of Tel-el-Kabir, and in the forced march to and occupation of Cairo (medal with clasp, and Khedive's bronze star); in the North-West Frontier Campaign of 1897-98, in the operations in the Kurram Valley (medal with two clasps); and in the Tirah Campaign of 1897-98, in the reconnaissance of the Khamana defile, and action of 7th November, 1897, and in the operations against the Khani Khel Chambannis where he was mentioned in despatches, in G. G. O. No. 244 of 1898 (clasp). He was for a long time Civil Surgeon of Satara, and as Colonel was P. M. O. of the 5th (Mhow) division. He got the C.B. on 19th June, 1911.

CIVIL ASSISTANT SURGEON MUHAMMED ISMAIL KHAN, Lecturer on Medicine, Medical School, Agra, to hold charge as Lecturer on Medical Jurisprudence, Hygiene, Chemistry and Physics as well as Superintendent, Male Students' Hostel, in addition to his own duties, *vice* Civil Assistant Surgeon Jaising Prabhu Das Modi, Rai Bahadur, granted leave.

DR. M. O'BRIEN, M.B., W.M.S., to be the Principal Women's Medical School, Agra.

Dr. E. Paul, M.R.C.S., L.R.C.P., to officiate as 3rd medical woman, Women's Medical School, Agra.

Dr. L. M. Ghosh, F.R.C.S., W.M.S., to be the 2nd medical woman, Women's Medical School, Agra.

HIS Excellency the Governor in Council is pleased to appoint Sub-Assistant Surgeon R. V. Mone, M.C.P.S., to act as House Surgeon, Sassoon Hospitals, Poona, *vice* Assistant Surgeon A. Da Gama, M.B., B.S., resigned.

THE undermentioned military pupils are admitted into the service, as temporary 4th Class Assistant Surgeons, with effect from the 29th April, 1918:—

Sydney James Bellgard, Arthur Gordon Brooks, Norman Augustine Tessiere D'Silva, Joseph Fermio Aloysius D'Souza, Louis John Maximian D'Souza, Arthur Whitby George, Allan Albert Morris Nolan, Percy Alexander Pierce, Gerald Eugene Arthur Prins, Joseph Anthony Sexton, and Ethelred Oliver Williams.

#### Army Medical Service.

SURGEON-LIEUTENANT-COLONEL SIR PETER JOHNSTON FREYER, K.C.B., M.D., retired, Indian Medical Service, to be temporary Hon. Colonel, 10th April, 1918.

Sir Peter is of course the well known late Civil Surgeon of Moradabad and stone-and-bladder-prostate expert, who has for many years past been on the staff of St. Peter's Hospital for Stone.

THE undermentioned to be temporary Lieutenants, subject to His Majesty's approval, with effect from the dates specified:—

Cajetan Manuel Gracias. 28th February, 1918.  
Gurudinanall Lokran Dudani. 11th May, 1918.



Shanker Ganpattrao Waglo. 20th May, 1918.  
In Army Department Notification No. 310, dated the 15th February, 1918, for "Bhuthapuri Krishnayya" read "Bhuthapuri Thevapperumal Krishnan."

THE Royal Warrant instituting a Bar for the Royal Red Cross, First Class, is re-published for information :—

GEORGE R. I.

Whereas we are desirous of providing for the recognition of further distinguished services in the case of persons who have been awarded the Royal Red Cross Decoration, First Class: it is Our Will and Pleasure and We do hereby ordain that anyone who, after having rendered services for which the Royal Red Cross Decoration, First Class, is awarded, subsequently renders such approved services as would, if she had not received the said Decoration, have entitled her to the same, shall be awarded a Bar to be attached to the said Decoration.

Given at Our Court at Saint James's this fifteenth day of December, 1917, in the Eighth year of Our Reign.

By His Majesty's Command,  
DERBY.

THE M. C. has been awarded to Captain Charles Newton Davis, I.M.S.; Temporary Lieutenant. V. R. Apte, I.M.S.; Lieutenant C. W. W. Baxter, I.M.S.; and Captain C. A. Godson.

MAJOR MAXWELL MACKELVIE, I.M.S., and Major R. M. BARROW, I.M.S., have been promoted Brevet Lieutenant-Colonel. (War Office, dated 26th March, 1918.)

Captain J. Scott, I.M.S., has been awarded the D.S.O. (War Office, 26th March, 1918.)

THE Governor-General in Council is pleased to sanction, under the provisions of paragraph 470, Army Regulations, India, Volume II, the special promotion, with effect from the 1st May, 1918, of the undermentioned Sub-Assistant Surgeon of the Indian Subordinate Medical Department, for services during the present war :—

1st Class Sub-Assistant Surgeon Gurditt Singh to be Senior Sub-Assistant Surgeon, 2nd Class, ranking as Jemadar.

SUBJECT to His Majesty's approval, Lieutenant-Colonel Nicholas Purell O'Gorman Lalor, M.B., has been permitted by the Right Honourable the Secretary of State for India to retire from the service, with effect from the 25th July, 1918.

Lieutenant-Colonel Lalor spent much of his time in the Sanitary Department in Burma, where he acquired a wide reputation as an expert sanitarian.

THE following promotions are made :—

Supernumerary Senior Assistant Surgeon and Honorary Captain George Oswald Weston is, on release from captivity as prisoner of war, absorbed in the rank of Senior Assistant Surgeon and Honorary Captain, subject to His Majesty's approval, *vice* Senior Assistant Surgeon and Honorary Captain V. V. Chiodetti, retained as supernumerary on attaining the age of 55 years, with effect from the 7th March, 1917.

Senior Assistant Surgeon and Honorary Lieutenant William St. Michael Hefferman, *seconded* (Supernumerary Senior Assistant Surgeon and Honorary Captain), is absorbed in the rank of Captain, subject to His Majesty's approval and to remain *seconded*.

Senior Assistant Surgeons and Honorary Lieutenants George Francis Byers and Charles Reginald Washington Baneroff, *seconded*, to be Senior Assistant Surgeons with the honorary rank of Captain, subject to His Majesty's approval and to remain *seconded*.

Senior Assistant Surgeon and Honorary Lieutenant William Thomas White to be Senior Assistant Surgeon with the honorary rank of Captain, subject to His Majesty's approval.

Senior Assistant Surgeon and Honorary Lieutenant William Joseph Key Stone, *seconded*, to be Senior Assistant Surgeon with the honorary rank of Lieutenant, subject to His Majesty's approval.

*vice* Senior Assistant Surgeon and Honorary Captain F. J. E. L'E. Newing, retained as supernumerary, on attaining the age of 55 years, with effect from the 16th September, 1917.

First Class Assistant Surgeon (Supernumerary Senior Assistant Surgeon and Honorary Lieutenant) Alexander Douglas Cunningham Pordrian, *seconded*, is absorbed in the rank of Senior Assistant Surgeon with the honorary rank of Lieutenant, subject to His Majesty's approval and to remain *seconded*.

First Class Assistant Surgeon Alexander John Hardaker to be Senior Assistant Surgeon with the honorary rank of Lieutenant, subject to His Majesty's approval, *vice* Senior Assistant Surgeon and Honorary Lieutenant W. C. McMillan, deceased, with effect from the 25th October, 1917.

Senior Assistant Surgeon and Honorary Lieutenant Herbert William Valentino Cox, *seconded*, to be Senior Assistant Surgeon with the honorary rank of Captain and to remain *seconded*.

Senior Assistant Surgeon and Honorary Lieutenant Herbert James Galloway to be Senior Assistant Surgeon with the honorary rank of Captain, subject to His Majesty's approval.

First Class Assistant Surgeon Arthur George Culpeper, *seconded*, to be Senior Assistant Surgeon with the honorary rank of Lieutenant, subject to His Majesty's approval and to remain *seconded*.

First Class Assistant Surgeon Guildford Thoy to be Senior Assistant Surgeon with the honorary rank of Lieutenant, subject to His Majesty's approval.

*vice* Senior Assistant Surgeon and Honorary Major T. Baldry retained as supernumerary, on attaining the age of 55 years, with effect from the 2nd February, 1918.

First Class Assistant Surgeon Herbert Edward Benson to be Senior Assistant Surgeon with the honorary rank of Lieutenant, subject to His Majesty's approval.

*vice* Senior Assistant Surgeon and Honorary Lieutenant S. G. Wood, deceased, with effect from the 4th February, 1918.

UNDER the provisions of paragraph 470, Army Regulations, India, Volume II, the promotion of the undermentioned Senior Assistant Surgeons to the rank of Lieutenant, notified in Army Department Notification No. 1142, dated 31st May, 1918, is antedated to the dates noted against their names :—

Guildford Thoy, 2nd August, 1917; Herbert Edward Benson, 4th August, 1917.

THE undermentioned Senior Assistant Surgeons are retained in the service after the age of 55 years until further orders, and will be borne as supernumeraries in their ranks and grades, with effect from the dates specified :—

Major Thomas Baldry, 2nd February, 1918; Captain Valentino Vincent Chiodetti, 7th March, 1917; Captain Francis James Edmund L'Estrange Newing, 16th September, 1917.

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Ahmed Karim, I.M.S., are dispensed with on account of ill-health, with effect from the 1st May, 1918.

SUBJECT to His Majesty's approval, the undermentioned officer is permitted to resign the service, with effect from the date specified :—

Major Percy Charles Woollatt, 1st May, 1918.

THE undermentioned 4th Class Assistant Surgeons having completed seven years' service in that class to be 3rd Class Assistant Surgeons, with effect from the 17th April, 1918 :—

Alan William Carleton, Albert Victor Wallace Samford, Edward Walker McNally, George Stanislaus Rozario, Christopher Joseph Rozario, Arthur Henry Day, Julius Francis deSouza Vincent, Allen St. Clair Bartley, Groydan Procter King, Manuel Tom Fernandez, Aloysius Neville Nys, Arthur Norman de Monte, Terence St. Aubyn Falloon, Henry Carlyle William Windsor, Robert Thomas Mansfield Hayter, Mark Vincent Jeromias Lobo, Arthur Benjamin Osbourne, Ciriaeo Elias deGama.



THE undermentioned to be temporary Lieutenants, subject to His Majesty's approval, with effect from the dates specified:—

Peston Byramji, 15th December, 1916; Maneck Nussorwanji Dubash, 24th March, 1918; Nagendra Narain Majumdar, 18th April, 1918; Coimbatore Krishna Anantanarayana Iyer, 30th April, 1918; Anthony Peter Dias, 4th May, 1918; Kesheo Ganesh Mohile, 13th May, 1918.

THE undermentioned military pupils having passed their final examination, are admitted into the service as 4th Class Assistant Surgeons, with effect from the 22nd April, 1918:—

Charles Stewart Netscher, James Anthony Amor, Richard Neville Arklie, Archibald Duncan Ross, Hugh Archer Murphy.

THE undermentioned Civil Sub-Assistant Surgeons who are employed on temporary military duty, in accordance with paragraph 16, Army Regulations, India, Volume VI, are granted, while so employed, military rank as shown below:—

#### CIVIL SUB-ASSISTANT SURGEONS.

##### *Temporarily ranking as Warrant Officers.*

Girdhar Lal, 31st January, 1918; Mohamed Amin, 4th February, 1918; Arjan Dass, 7th February, 1918; Shama Charan Varma, 9th February, 1918; Tripura Shanker Kalidas Joshi, 11th February, 1918; Abdul Karim, 16th February, 1918; Basudev Prasad Choubay, 20th February, 1918; Debendra Nath Sen Gupta, 20th February, 1918; Anant Ram, 20th February, 1918; Rashid-ud-Din, 22nd February, 1918; Satish Chandra Ray, 22nd February, 1918; Sohan Lal Chopra, 23rd February, 1918; Thandi Ram, 26th February, 1918; Saiyid Agha Hussain, 26th February, 1918; Chandi Charan Chakravarti, 26th February, 1918; Chintaman Krishnaji Bade, 4th March, 1918; Promada Charan Nag, 6th March, 1918; Bhani Raj Choudhury, 7th March, 1918; Kamal-ud-Din, 9th March, 1918; Indu Bhusan Mukerji, 12th March, 1918; Naresh Chandra Ray, 13th March, 1918; Abdul Wahid Juma Khan, 15th March, 1918; Haran Chandra Sen, 16th March, 1918; Harendra Kumar Rai, 18th March, 1918; Hakumat Rai, 19th March, 1918; Ramchand Khilumal, 20th March, 1918; Mohamed Ali Nirhurokhan, 21st March, 1918; Vishnu Keshao Lagu, 23rd March, 1918; Ayilliath Kannan Nambiar, 24th March, 1918; Chimanlal Harjivandas Shah, 24th March, 1918; Nathe Khan, 26th March, 1918; Faqir Chand Bharbhakar, 27th March, 1918; Waman Balvant Kulkarni, 29th March, 1918; Dovi Dayal Kapur, 29th March, 1918; Sitaram Pandurang Desai, 31st March, 1918; Charn Das, 1st April, 1918; Nand Lal Wig, 3rd April, 1918; Ochhavil Maneklal Parekh, 4th April, 1918; Jai Singh, 8th April, 1918; Shanka Govind Kurlekar, 10th April, 1918; Mukand Lal, 11th April, 1918; Habiullah, 11th April, 1918; Ganesh Ram Bhatta, 11th April, 1918; Diwan Chand, 14th April, 1918; Bhai Arjan Singh, 17th April, 1918; Gopal Mahadeo Shinde, 22nd April, 1918; Hans Raj, 1st May, 1918.

THE Stewart Prize has been awarded to Lieut.-Colonel R. McCarrison, F.R.C.P., I.M.S., on the recommendation of a Science Committee signed by Sir Clifford Allbutt, for his researches into the physiology and pathology of the thyroid and parathyroid glands, and for light thrown on the epidemiology of goitre.

The Stewart Prize was founded by the late Dr. Patrick Stewart, of the Middlesex Hospital, to be a recognition of important work done on the origin and spread of epidemic disease.

This is not the first time that this notable award has been given to I. M. S. men. In 1882 the first award was made to Surgn.-Major Vandyke Carter, of the Bombay Medical Service, for work done on spirillar or relapsing fever. Lieut.-Col. D. D. Cunningham, F.R.S., obtained it in 1895 for his work (now more than ever recognised) on the cholera vibrio; Major Geo. Lamb received it in 1910 for his plague investigations. Besides these, Sir Patrick Manson got it in 1901, Colonel Sir D. Bruce in 1903, Surgn. F. J. Dalton, R.N., in 1899, and Sir W. W. Horrocks in 1916 (for work done in "the prevention of epidemic disease in the British Army on the Continent").

We hereby congratulate Lt.-Col. McCarrison on this additional recognition of his work.

WITH reference to Army Instruction (India) No. 137 of 1918, and paragraph 344, Army Regulations, India, Volume II, a preliminary issue of four inches of riband is sanctioned for each individual now serving who is entitled to the decoration.

2. The "1914 Star" is to be considered a war medal, and is to be worn as such in accordance with paragraphs 47 and 52, Army Regulations, India, Volume VII. The riband will be worn with the red edge on the right, *i.e.*, with the red edge farthest from the left shoulder.

3. Indents for the riband on the scale sanctioned in paragraph 1 may be submitted to the Officer-in-Charge, Medal Distribution, Army Department, Calcutta, with reference to Army Instruction (India) No. 418 of 1918. The indents will show the number of officers and others for whom the riband is required, and will contain a certificate signed by the indenting officer that the Individuals for whom the riband is required are entitled to the "1914 Star" in accordance with the provisions of Army Instruction (India) No. 137 of 1918.

4. Indents for riband for officers, soldiers, members of nursing services not serving with any unit, will be submitted by the head of the department, office or hospital in which they are employed.

5. Supply will be made as stocks become available, and the riband may be worn as soon as issued.

It has been decided that temporary officers of the Indian Medical Service, originally engaged in England by the Secretary of State for India, may be permitted to re-engage under the terms of their original engagement, provided they have been continuously employed since their first appointment.

MAJOR DENHAM-WHITE, I.M.S., has joined the staff of the Presidency General Hospital, Calcutta, and Capt. V. A. Green-Armytage, I.M.S., the Medical College, Calcutta.

ON return from Kashmir of Lt.-Col. F. P. Maynard, F.R.C.S., I.M.S., Major W. Coppinger took charge of the Hospital, Calcutta, and Lt.-Col. F. O'Kinealy got leave to Kashmir.

THE services of Lt.-Col. F. P. Connor, F.R.C.S., D.S.O., I.M.S., are placed permanently at the disposal of the Government of Bihar and Orissa, with effect from the 28th January, 1918. His services will remain temporarily at the disposal of His Excellency the Commander-in-Chief in India.

THE services of the undermentioned officers are placed permanently at the disposal of the Government of Bengal, with effect from the dates noted against their names. The services of Major M. Mackelvie, I.M.S., will remain temporarily at the disposal of His Excellency the Commander-in-Chief in India:—

Brevet Colonel M. Mackelvie, M.B., F.R.C.S.E., I.M.S., 28th March, 1917.

Major H. B. Foster, M.D., I.M.S., 29th January, 1918.  
Major H. B. Steen, M.D., I.M.S., 31st March, 1918.

IN supersession of the Home Department Notification No. 126, dated the 18th May, 1917, Major H. B. Steen, M.D., I.M.S., is appointed to be Professor of Midwifery, Medical College, and Obstetric Physician and Surgeon of the Medical College Hospital, Calcutta, substantively *pro tempore* with effect from the 24th December, 1916, until further orders.

Major Steen has been acting Professor since the promotion of Colonel C. R. M. Green, F.R.C.S., now Inspector-General of Civil Hospitals in the Central Provinces.

1. SANCTION is accorded to the following arrangements with effect from the date of this Instruction, and for the remaining period of the war (11th June 1918.):—

(a) The present Assistant Director of Medical Services, Bangalore and Southern Brigades, to be Assistant Director of Medical Services, Bangalore Brigade, with the office establishment already authorised for the combined Brigades.

(b) An Assistant Director of Medical Services to be appointed to the Southern Brigade and located at Wellington, with the following office establishment:—

|                          |                            |
|--------------------------|----------------------------|
| One military staff clerk | ... on Rs. 140 per mensem. |
| One soldier clerk        | ... " " 20 " "             |
| One soldier clerk        | ... " " 15 " "             |
| One peon                 | ... " " 10 " "             |

2. Allowances for office contingencies will be found from the existing divisional grant.

3. The expenditure involved is debitable to the ordinary grant and head of account.

It has been decided that a sub-charge allowance of Rs. 10 per mensem will be granted to a sub-assistant surgeon placed in sub-charge of a mule transport unit, provided that the sub-charge does not already form part of his or another sub-assistant surgeon's normal duty, *vide* Army Regulations, India, Volume VI, paragraph 193.

2. It has also been decided that an extra allowance at the rates laid down for the wing of a regiment, etc., in Army Regulations, India, Volume I, paragraph 957 (2) as inserted by October Appendix

India Army Orders 1917, will be granted to a sub-assistant surgeon placed in *additional* medical or sub-medical charge of a mule transport unit.

It has been decided, with the approval of the Right Hon'ble the Secretary of State for India, that retired senior Sub-Assistant Surgeons of the Indian Subordinate Medical Department, re-employed during the period of the war, shall be eligible for the grant of the honorary rank of Assistant Surgeon in exceptional cases of meritorious service.

His Excellency the Governor of Bombay in Council is pleased to make the following appointments pending further orders:—

Assistant Surgeon Dara Jamasp Asana, L.M. & S., to act as Civil Surgeon, Mahabaleshwar.

Assistant Surgeon G. R. DeSouza Fylinto, L.M. & S., to be substantive *pro tem.* Civil Surgeon, Karwar.

Assistant Surgeon Kashinath Ganesh Palkar, L.M. & S., to act as Civil Surgeon, Karwar, from the date of his taking over charge from Assistant Surgeon D. J. Asana, L.M. & S., until the arrival of Assistant Surgeon G. R. DeSouza Fylinto, L.M. & S.

His Excellency the Governor of Bombay in Council is pleased to appoint Major I. D. Jones, M.D. (Lond.), L.M.S., to act as Civil Surgeon, Ahmednagar, in addition to his military duties, during the absence on leave of Lieutenant-Colonel H. A. F. Knapp, L.M.S., or pending further orders.

Captain T. A. Weston, M.B., R.A.M.C., acted as Civil Surgeon, Hyderabad, with attached duties, in addition to his military duties, from the 28th March, 1918, to the 12th April, 1918, both days inclusive.

His Excellency the Governor of Bombay in Council is pleased to appoint Major J. B. Christian, L.M.S., to be substantive *pro tem.* Civil Surgeon, Hyderabad, with attached duties, with effect from the 13th April, 1918.

His Excellency the Governor of Bombay in Council is pleased to make the following appointments during the absence on leave of Assistant Surgeon Rao Bahadur M. M. Modi, L.M. & S.:—

Assistant Surgeon R. S. Poredi, L.M. & S., to act as Civil Surgeon, Thana, with attached duties.

Assistant Surgeon V. D. Merchant, L.M. & S., to be substantive *pro tem.* Civil Surgeon, Broach.

Assistant Surgeon S. C. Jarivala, L.M. & S., to act as Civil Surgeon, Kaira.

The Governor of Bombay in Council is pleased to make the following appointments:—

Mr. C. H. Brierley to be Superintendent of the Deccan Convict Gang, *vice* Mr. C. N. Hall, who has been treated as a supernumerary, but to remain as substantive *pro tem.* Superintendent of the Central Prison at Yeravda.

Khan Saheb K. M. Clubwalla to be Superintendent of the Special Prison at Thana, but to remain as substantive *pro tem.* Superintendent of the Central Prison at Hyderabad.

Khan Saheb N. R. Wacha to be Superintendent of His Majesty's Common Prison at Bombay, but to remain as substantive *pro tem.* Superintendent of the Central Prison at Ahmedabad.

Mr. C. M. Roberts to be Superintendent of His Majesty's House of Correction at Bombay, but to continue as substantive *pro tem.* Superintendent of the Special Prison at Thana.

Mr. F. B. Plunkett to be Personal Assistant to the Inspector-General of Prisons, but to continue as substantive *pro tem.* Superintendent of His Majesty's House of Correction at Bombay.

Mr. R. M. Lafa to be Superintendent of the District Prison at Karaobi, but to continue to be substantive *pro tem.* Superintendent of His Majesty's Common Prison at Bombay.

Lieutenant-Colonel A. Street, F.R.C.S., L.M.S., was granted privilege leave of absence with effect from the 29th April, 1918, to 15th June, 1918, both days inclusive.

His Excellency the Governor of Bombay in Council is pleased to make the following appointments during the absence on leave of Lieutenant-Colonel A. Street, F.R.C.S., L.M.S.:—

Lieutenant-Colonel T. S. Novis, F.R.C.S., L.M.S., to act as Senior Medical Officer, J. J. Hospital, in addition to his military duties.

Lieutenant-Colonel S. C. Evans, M.B., C.M., L.M.S., to act as Principal, Grant Medical College, in addition to his own duties.

Mr. G. B. PRABHAKAR, L.R.C.P. (Lond.), L.F.P.S. (Glas.), L.M. & S., is granted privilege leave of absence for one month with effect from the 13th May, 1918.

His Excellency the Governor of Bombay in Council is pleased to appoint Dr. J. N. Duggan, D.O. (Oxon.), F.R.C.S., L.M. & S., to act as Professor of Ophthalmic Medicine and Surgery, Grant Medical College, and Ophthalmic Surgeon, Bombay, during the absence on leave of Mr. G. B. Prabhakar, L.R.C.P. (Lond.), L.F.P.S. (Glas.), L.M. & S.

MR. K. D. KHAMBATTA, D.P.H., Deputy Sanitary Commissioner, Sind Registration District, has been granted privilege leave for two months and eleven days combined with leave on medical certificate for nineteen days with effect from 20th April, 1918.

His Excellency the Governor of Bombay in Council is pleased to appoint Mr. B. P. Sabawala, L.M. & S., M.R.C.S., L.R.C.P. (Lond.), F.R.C.S. (Edin.), to be Honorary Surgeon, J. J. Hospital, for a period of one year with effect from the 1st May, 1918, *vice* Mr. Dinsha D. H. Baria, L.M. & S., F.R.C.S. (Eng. & Edin.), L.R.C.P. (Lond.).

MAJOR J. M. HOLMES, M.B., L.M.S., was appointed substantively *pro tempore* to be Health Officer, Simla, with effect from the afternoon of the 2nd May, 1918, until further orders.

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters, and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage, abroad.

## BOOKS, REPORTS, &c., RECEIVED:—

Yealland and Buzzard's *Hystorical Disorders of Warfare*. Macmillan & Co. Price, 7s. 6d.

Carrell and Dehelly's *Treatment of Infective Wounds*. Baillière, Tindall & Cox. Price, 6s.

T. C. Chaudhuri. *Life of Sir William Ramsay*. Butterworth & Co., India.

Ghosh and Deoro's *Materia Medica*. (7th Ed.) Hilton & Co., Calcutta. Price, Rs. 5-10.

Cestodo Parasites of Hilsa. Indian Museum Records. Vol. XV, Part 2, Page 9.

## LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

Major Norman White, L.M.S., Simla; Surgn.-Genl. P. Hchir, L.M.S., Rawalpindi; Dr. W. B. Orme, Lower Perak, F.M.S.; Dr. R. Hay Pulipaka, Gaya; Lt.-Col. J. C. Vaughan, L.M.S., Ranchi; Major E. O. Thurston, L.M.S., Nepal; Dr. Podley, Rangoon; Dr. G. K. Tambe, Narsingpur, C.P.; Lt.-Col. Maynard, L.M.S., Kashmir; Major C. Hudson, L.M.S., Rawalpindi; Major Hingston, L.M.S., Madras.

## Original Articles.

AN UNCLASSIFIED FORM OF LONG CONTINUED PYREXIA IN MESOPOTAMIA.  
(? DISSEMINATED NOCARDIOSIS)

## PRELIMINARY REPORT \*

By C. A. SPRAWSON, M.D., M.R.C.P.,

LT.-COL., I.M.S.,

Consulting Physician, Mesopotamian Expy. Force,

## WITH A PATHOLOGICAL DESCRIPTION

By F. P. MACKIE, M.D., M.Sc., M.R.C.P., F.R.C.S.,

MAJOR, I.M.S.

O. C. Central Laboratory, Mesopotamian Expy. Force.

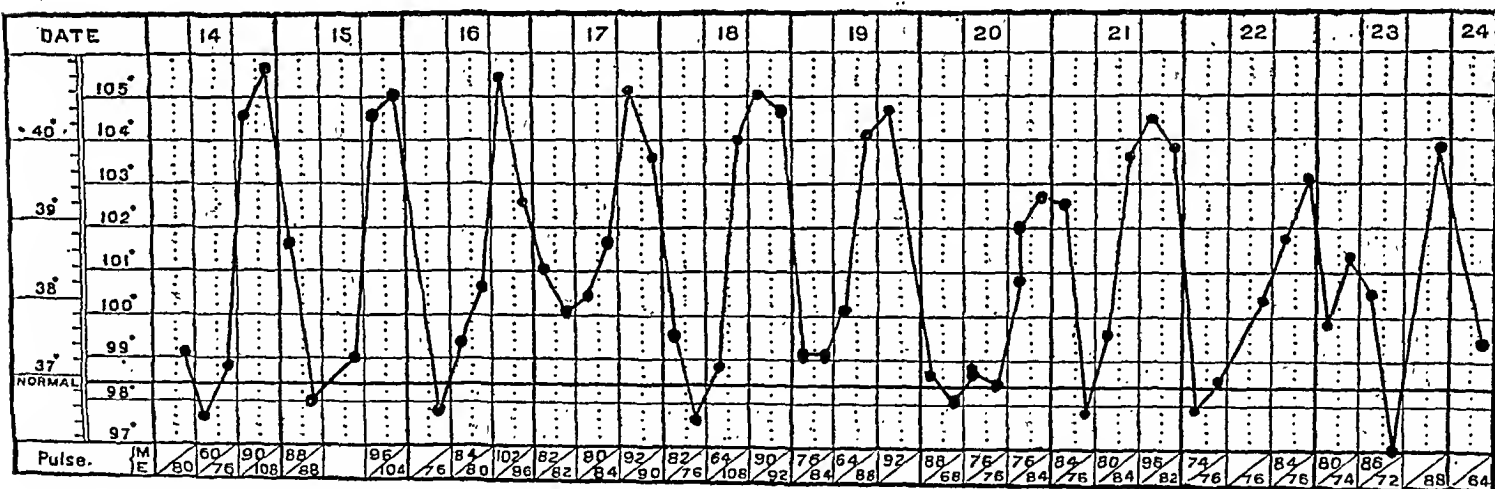
THE fact of meeting in the course of the last six months with several cases of similar clinical signs, none of which has yet during life yielded by laboratory methods an organism or a reaction diagnostic of any disease, makes it desirable to put this short series of cases on record. Reflection on these cases seems to indicate that probably the patients in question were suffering from one and the same disease and that this disease is a clinical entity.

soldiers and six Indians,—are here dealt with. Another typical case has been seen, but is not here described as it did not come under my care. In one of our cases a fatal ending gave opportunity for an autopsy; in another recovery seems to be occurring. The remaining cases, so far as traceable, have the disease still acute.

This paper is intended as a preliminary report. I hope to be able to give a further account when I have seen more cases and been able to follow some of the present cases further, and had the opportunity of securing more post-mortem material. I hope also that the publication of this report may have the effect of directing the attention of medical officers to the clinical syndrome described and so lead to the detection of similar cases.

CASE No. 1.—Lieut. P., age 21 years. Nine months in Mesopotamia, was admitted to hospital on January 3, 1918. Fever is said to have begun with a rigor on January 1, and there was slight enlargement of the spleen. Because of this and the fact that two months previously the patient had been in the same hospital for malaria and benign tertian parasites were then found, the case was regarded as malaria and 30 grains of quinine were given daily. He had been taking 10 grains daily since the end of his malarial attack in November.

There were no other signs and symptoms than those already mentioned: the pulse varied between 76 and 112. Between January 4 and 18 (Chart I) the temperature



This disease has resemblance to kala-azar in that its chief features are long continuous or intermittent pyrexia with occasional short apyrexial intervals, a large spleen, slight enlargement of the liver, occasional dark pigmentation and leucopenia, usually with relative diminution of the polymorphonuclear leucocytes; in addition bronchitic and pleuritic or pulmonary signs, especially at the base of the right lung, appear to be present in all cases at some period of the illness.

Some cases of this nature have been noticed earlier, but their evacuation to the Base for military reasons has prevented their being followed up. Notes of ten recent cases,—four British

continued of the remittent type, the rise being always in the evening and generally associated with a rigor or a feeling of chilliness. During this period the following pathological investigations were carried out:—

1. Blood culture ... Sterile twice.
2. Blood smears (fresh) ... No parasites found.
3. Leucocyte count ... Total 4,480 per c.mm.  
 Polymorphs ... 46 per cent.  
 Lymphocytes ... 46 "  
 Large mononuclears 8 "  
 Eosinophiles ... Nil.
4. Widal Reaction ... Negative to T. A. B.

During this time, besides receiving quinine by the mouth almost continuously in doses of 30 grains daily, quinine 10 grains by intramuscular injection was given four times and 12 grains intravenously twice. The temperature was unaffected. From January 20 to February 18 the fever continued, but the daily

\* Received for publication, 30th July, 1918.—ED., I. M. G.

remissions were not so great. The following further pathological investigations were made :—

1. Stools ... No amœbæ or cysts. No enteric group on culture.
2. Urine ... No abnormal constituents. Sterile on culture.
3. Blood ... Smears. No malaria, no Leishmania, no mononuclear increase, no changes in the red cells.
4. Agglutination ... Tested against *M. melitensis*,—negative.

The spleen had by now increased in size and was quite three fingers' breadth below the costal margin. On February 19 the spleen was punctured by Major Mackie, I.M.S., and the material obtained examined microscopically and by culture. Both were negative pathologically.

From now the fever became more continuous in type and a troublesome dry cough developed, sometimes coming in short paroxysms. By February 24 definite signs appeared in the back of the right side of the chest from the base of the lung up to the scapular spine. The percussion note was dull and the air entry weak; no râles or friction sound. The cough was relieved by the expectoration of some mucopurulent sputum, which latter for a day or so was tinged with blood. No tubercle bacilli were found in the sputum: pneumococci were abundant. The patient was twice, at intervals of about three weeks, put under the X-ray screen. Movement of the diaphragm was free on both sides and no abnormal shadow was present. A leucocyte count now showed :—

|                    |                 |                |  |
|--------------------|-----------------|----------------|--|
| Total              | 5,200 per c.mm. |                |  |
| Polymorphs         | ...             | 64.7 per cent. |  |
| Lymphocytes        | ...             | 26.7 " "       |  |
| Large mononuclears | ...             | 9.9 " "        |  |
| Eosinophiles       | ...             | 1.1 " "        |  |
| Mast cells         | ...             | 0.6 " "        |  |

Except for the signs in the right chest and the splenic enlargement, nothing abnormal could be found.

On March 11, under a general anæsthetic, exploration of the right pleural cavity and of the liver was done. On exploration the pleura was about 1½ inches above the angle of the right scapula. The needle evidently penetrated lung tissue for over an ounce of bright, frothy blood was coughed up, followed by two pieces of stringy muco-fibrinous material. Microscopically this material showed numerous bacilli resembling *B. Friedländer*; but it was considered that they came from the interior of small bronchi. Whether as a result of this procedure or not, the lung signs improved from this date and together with the cough finally disappeared by the middle of April. Emetine, gr. 1 daily, was given empirically for six days without result.

On March 20th and 27th the temperature was normal, then a long period of remittent temperature followed. The general condition had improved and the appetite was better, but the patient was very thin.

Four examinations of the sputum were negative to T. B. The leucocyte count remained low, but had advanced to 6,800 per c.mm. on April 2nd.

Another almost afebrile period occurred from April 17 to 21; then the temperature rose again. On April 27 neosalvarsan 45 gm. was given intravenously—on the possibility of the disease being some spirochætal infection: no effect was produced. On May 9 the spleen was still about two fingers' breadth below the ribs and felt hard and a little tender. The edge of the liver could be felt also: this being quite a recent feature. No enlarged lymphatic glands were felt.

The leucocytes had again fallen, being 5,400 per c.mm.

|                    |     |              |
|--------------------|-----|--------------|
| Polymorphs         | ... | 63 per cent. |
| Lymphocytes        | ... | 21 " "       |
| Large mononuclears | ... | 15 " "       |

After the use of quinine had been stopped no specific treatment except that above indicated was adopted

although methylene blue for a short time and liquor arsenicelis in increasing doses up to m. viii t. d. s. were given. The last was badly tolerated. On May 12 the patient was evacuated to the Base. On June 16 his condition is reported to be the same.

CASE No. 2.—Pte. K., age 26 years, a British soldier, 11 months in Mesopotamia, suffered from slight heat-stroke in July, 1917, and has felt weak since then. He has never had any cough. On January 21, 1918, he reported sick for weakness and shortness of breath on exertion. He was transferred to a hospital at the Advanced Base as suffering from "debility." The temperature (Chart II) was continuously high or intermittent, ranging between 98°F. and 104°F. The spleen is said to have been enlarged then, and the upper lobe of the right lung dull on percussion. The liver reached two fingers' breadth below the costal margin. There was no cough and no pain. The pulse was about 100. He appeared anæmic and wasted. A blood film (two examinations) showed no malarial parasites.

At the beginning of April he appeared very ill and wasted. The tongue was clean. There was some loss of resonance at the base of the right lung behind and moist sounds were heard at both bases. The spleen extended nearly to the level of the umbilicus, and the edge of the liver was an inch and a half below the costal margin. The deep reflexes appeared somewhat more active than usual. There was no cough and no sputum. There was no other abnormal sign.

Blood films showed no parasites; and after one negative examination the stools showed only the cysts of *Entameba coli*. Blood counts throughout his illness were as follows :—

|                   | Feb. 21.        | April 1.  | April 3. | May 1.    | May 21. |
|-------------------|-----------------|-----------|----------|-----------|---------|
| Red cells         | ...             | 5,250,000 | ...      | 5,500,000 | ...     |
| White cell        | Total ... 1,800 | 1,250     | 1,600    | 2,500     | 1,000   |
| Polymorphs,       | per cent. 53    | 9         | 12.5     | 66        | ...     |
| Small lymphocytes | " " 31.2        | 54.5      | 62.25    | 20.75     | ...     |
| Large lymphocytes | " " 10.2        | 20.5      | 19.75    | 6.0       | ...     |
| Transitionals     | " " 2.4         | 15.5      | 15.5     | 7.25      | ...     |
| Eosinophiles      | " " 0.2         | 0.5       | 0.0      | 0.0       | ...     |

The spleen was punctured, and the material obtained was negative on microscopical examination and on culture. The stools, again examined, were negative as regards *E. histolytica*.

Large doses of quinine continued for several days were without effect.

Under the X-rays both sides of the diaphragm were seen to move freely.

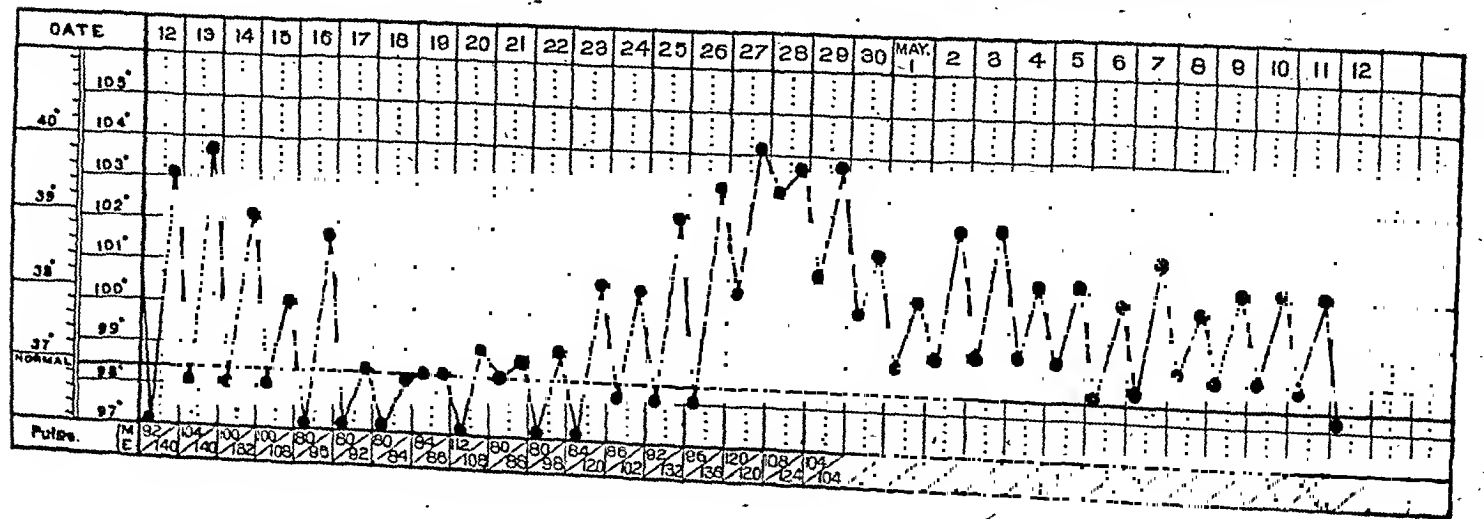
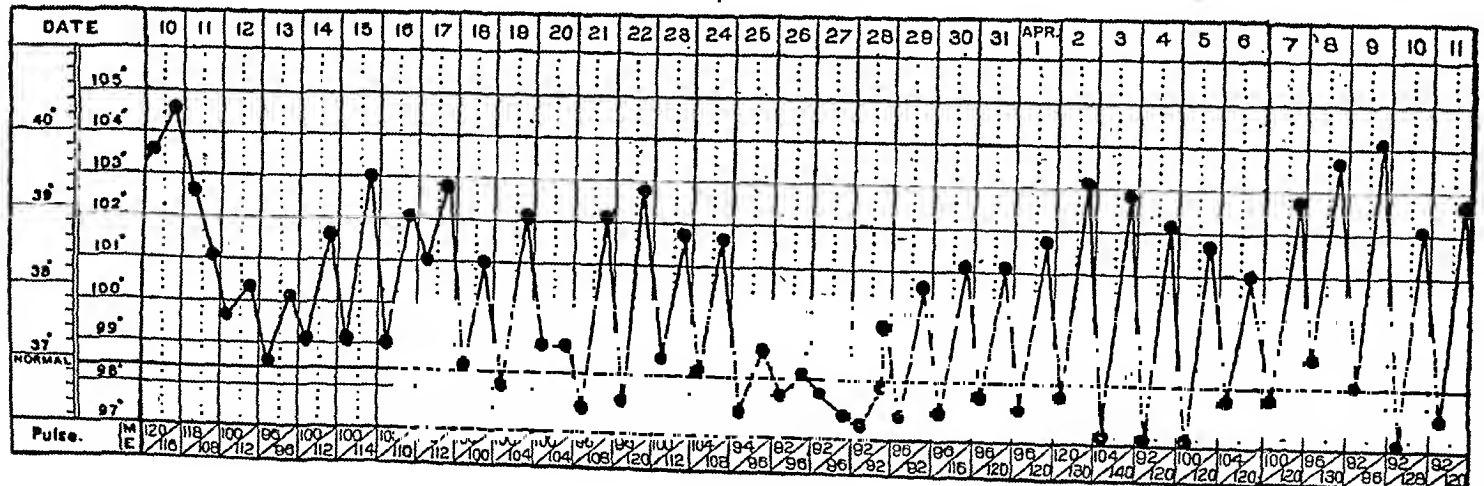
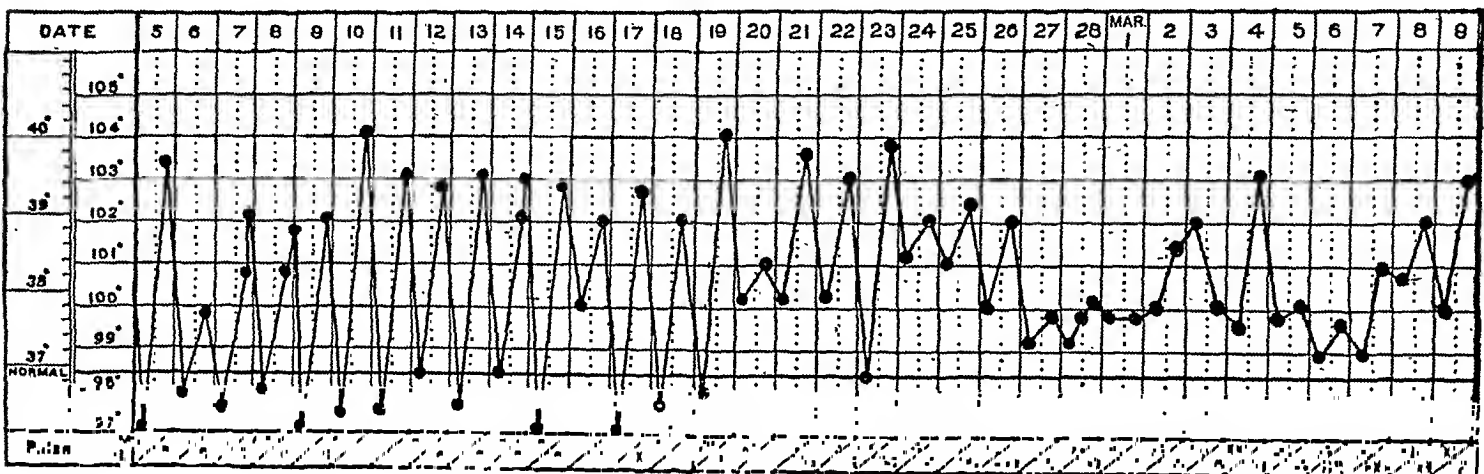
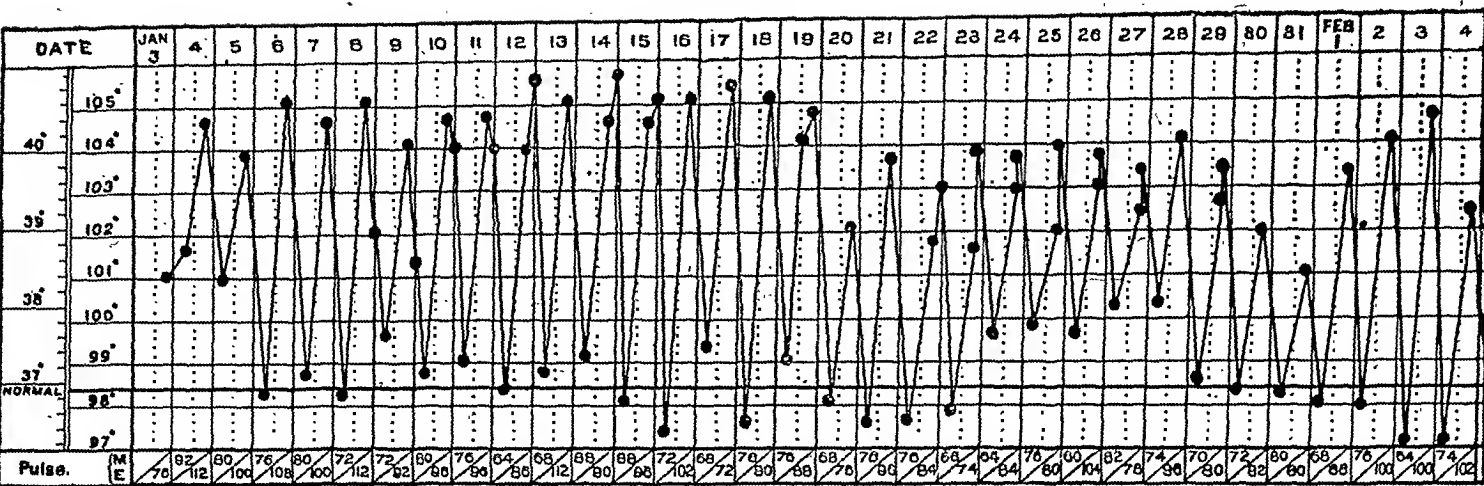
For the month the patient appeared to improve considerably in general health, an improvement reflected also in the leucocyte count of May 1. The signs in the right lung also became less, and those in the left lung disappeared.

On May 8 there were still fine crepitations at the right base and flank and near the lower angle of the scapula. On May 21 the spleen and liver were as before, there were many crepitations at the right base and the patient was evidently losing ground rapidly: see also the blood count on this date. He was again screened and the diaphragm seen to move equally on both sides. The liver was punctured on May 22, the material removed contained no Leishman-Donovan bodies. He died on May 25 and the autopsy was performed two hours after death.

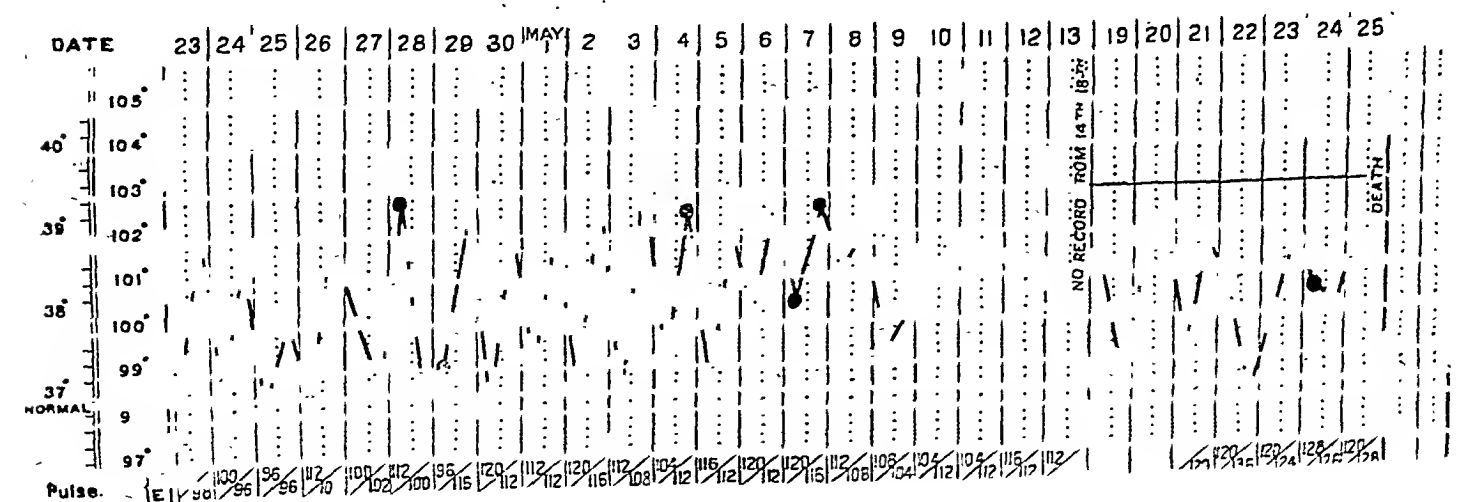
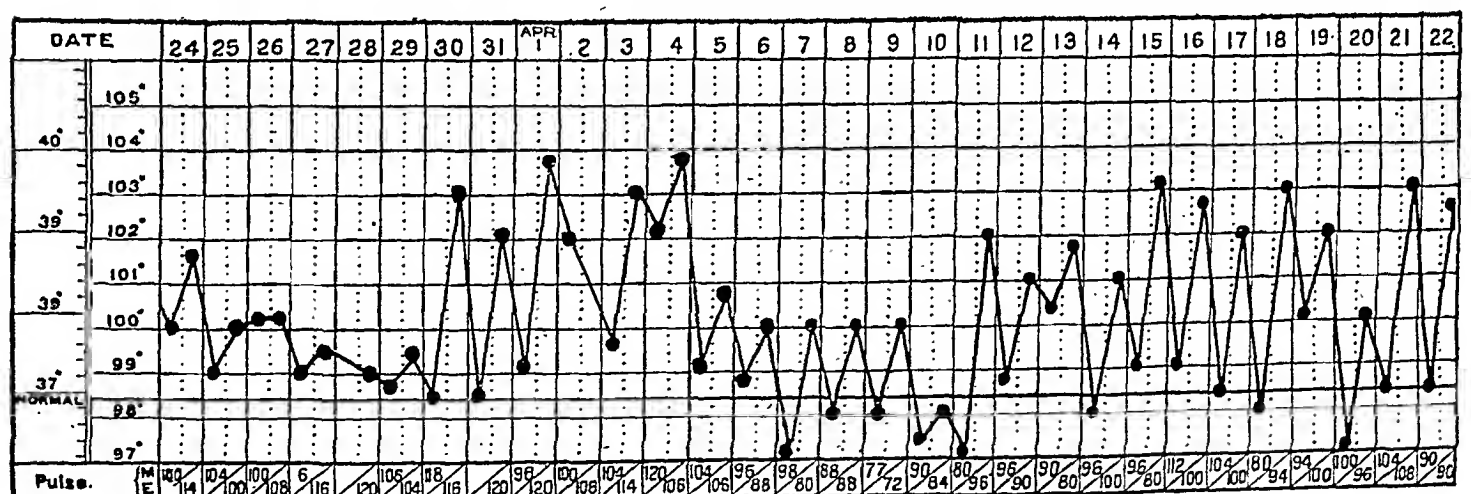
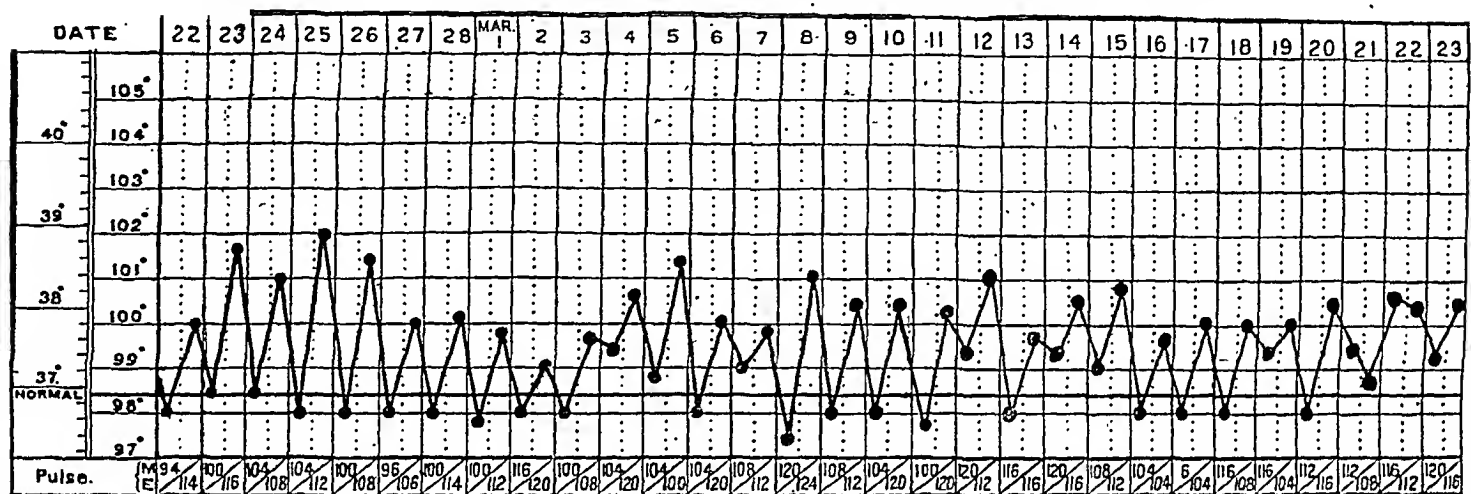
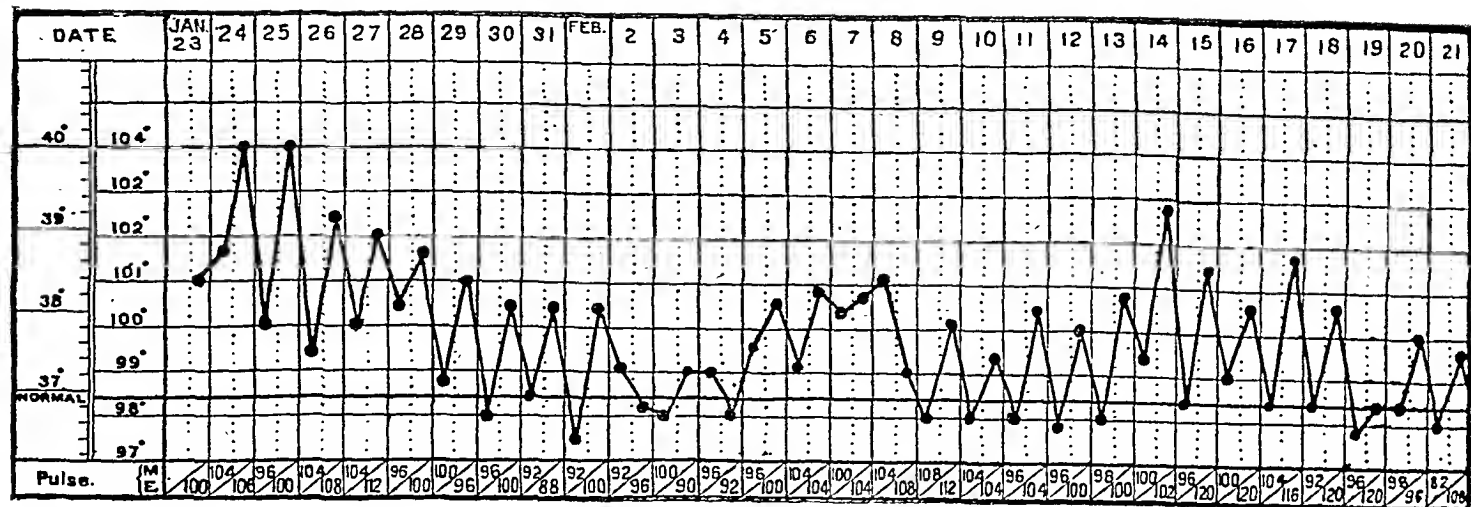
Autopsy.—Body emaciated. Pericardium containing a little clear fluid: heart about half the usual size. No endocarditis. Right lung collapsed and adherent to chest wall over its whole surface. Both lungs small and congested. No signs of tubercle. Thyroid gland reduced in size: no isthmus. Spleen very large, ten inches long, weighing about 2½ lb. No Leishman-Donovan bodies or other parasites in smears taken and examined immediately. Liver much enlarged, weight estimated at 5 lb., nutmeg type. Colon small: no intestinal ulceration. Kidneys and other organs apparently normal.



# CHART I.







This is the case specimens from whose organs were sent to Major Mackie for section and are described by him below.

CASE No. 3.—Private G., L. N. L. Regiment, nine months in Mesopotamia, was in hospital in December, 1917, for tapeworm. The worm was only partially expelled and after a time in the Convalescent Dépôt this soldier was re-admitted to hospital in February complaining of general weakness. At this time he was very thin and somewhat pale with a pink flush on the cheeks. The tongue was furred and the breath offensive. The spleen was enlarged to two fingers' breadth below the costal margin. The temperature showed an evening rise and ranged between 97.6°F. in the morning and 103°F. in the evening. The pulse rate was about 72. Urine was normal and at this time there were no other abnormal signs than those already mentioned. Blood films showed no parasites, and a blood culture was negative on February 14.

Leucocyte counts were recorded as follows:—

|                   | Feb. 13th. | Mar. 11th. | Mar. 24th. | Apl. 2nd. | Apl. 10th. | Apl. 23rd. | May.  |
|-------------------|------------|------------|------------|-----------|------------|------------|-------|
| Total             | 3,200      | 4,400      | 2,800      | 2,500     | 2,800      | 3,125      | 2,800 |
| Polymorphs        | 41.5       | 46.5       | 46.5       | .....     | 50.5       | 46         | 47    |
| Small lymphocytes | 31.0       | 26.5       | 35.5       | .....     | 35.5       | 40.5       | 34    |
| Large lymphocytes | 16.0       | 17.5       | 8.5        | .....     | 6.0        | 5.5        | 9     |
| Transitionals     | 11.0       | 9.0        | 9.0        | .....     | 8.0        | 8.0        | 10    |
| Eosinophiles      | 0.5        | 0.5        | 0.5        | .....     | 0.0        | 0.0        | 0     |

On February 20 blood films were again reported negative, and a stool culture was negative for enteric-group organisms. The temperature continued intermittent, occasionally remittent through March. On a few days a double rise in the 24 hours was detected, but this was only an occasional phenomenon. The spleen remained enlarged, hard and tender. The temperature appeared uninfluenced by 20 grains of quinine daily for ten days. A culture from the urine was sterile. On March 25th the body of the tapeworm was expelled after a dose of flixmas; the head was not seen.

On March 25 the spleen was punctured; neither Leishman-Donovan bodies nor malarial parasites were in the material obtained. Culture however showed a red micrococcus.

On April 11 a slight enlargement of the liver was detected. The base of the right lung also was slightly dull to percussion and the breath sounds were deficient in this area. The temperature became continuous in type, reverting to its intermittent character at the end of the month. At the beginning of May it again became continuous and remained so.

On April 22 the spleen was found enlarged to three fingers' breadth below the costal margin. On April 25th there were signs of bronchitis in the left chest, and a little sputum was obtained. This was negative to tubercle bacilli on three examinations. Nor were spirochaetes seen nor other unusual organisms; only pneumococci apparently. By April 29 these signs in the left chest had almost entirely disappeared. The spleen was again punctured on May 3: no parasites were seen in the material removed. Meanwhile the stools to enteric group had been cultured thrice again and were always negative organisms, but twice showed a number of coccus colonies. A catheter specimen of the urine was taken on May 7 and the culture showed a large Gram-positive staphylococcus in numbers. This was repeated on May 11 and staphylococcus aureus was obtained.

On May 15 the patient was evacuated to the Base.

CASE No. 4.—Lance-Naik D. G., a Gurkha soldier aged 23, two years in Mesopotamia, reported sick on January 1, 1918, suffering from fever. The temperature was intermittent, there being a daily evening rise to 102°F. or more. Quinine by the mouth was without

effect, but the intramuscular injection of 5 grains for a few days seemed to bring down the temperature. This effect of the quinine, however, was only apparent, as a study of the chart shows the frequent relapses, which are without explanation or correspondence with increase in the physical signs and may perhaps be due to an inherent periodicity in the nature of this pyrexia itself.

On January 13 the spleen was noted as much enlarged and the liver also as large: the spleen was said to be three inches below the ribs. On February 8 in an almost apyrexial interval he was said to be much improved. On February 14 there were signs of bronchitis, râles and rhonchi at both bases. He was evacuated from the Front line with a diagnosis of broncho-pneumonia. Sputum examined on these occasions contained no tubercle bacilli. There was little change for the next two months, liver and spleen remained enlarged and tender. On April 18 the right lung was said to be dull at the base.

On April 22 blood films were negative for relapsing fever and for malarial parasites. On April 29 a stool culture was negative for enteric group. On May 8th a few tubercle bacilli were reported present in the sputum: subsequent examinations of the sputum, however, were again negative. Leucocyte counts were as follows:—

|                       | May 7. | June 1. |
|-----------------------|--------|---------|
| Total                 | 1,900  | 3,900   |
| Polymorphs, per cent. | 50.0   | 43.5    |
| Lymphocytes, "        | 48.0   | 39.0    |
| Large mononuclears, " | 2.0    | 3.0     |
| Hyalines, "           | .....  | 13.0    |
| Mast-cells, "         | .....  | 0.5     |

The rise in the number of leucocytes was coincident with considerable improvement in his general condition.

Splenic punctures on May 9 and June 6 were negative for Leishman-Donovan and malarial parasites. By May 14 the bronchitic signs had cleared up, but the right base was somewhat dull, and the breath sounds were deficient in that area. On June 6 the spleen is still enlarged to about two inches below the costal margin, a little smaller than previously. This patient has much improved, the temperature has been normal for some days, he has evidently put on flesh and appears to be recovering. He is now to be evacuated to the Base.

CASE No. 5.—Driver P., a British soldier, gives a history of previous malaria in India, but apparently the blood was not then examined. Since January 12 he has had fever, at first continuous, but after January 31 intermittent. Blood films and blood cultures were both negative when taken in the first few days of the fever. He was diagnosed as broncho-pneumonia and when seen on February 27 was having a daily evening rise of temperature to 103° or 104°F. The tip of the spleen could be just felt below the costal margin. Moist râles were heard over both sides of the chest. The sputum, however, was very scanty and sometimes in the morning contained a little blood. This blood, however, was thought to come from the inferior turbinate mucous membrane, which was seen to be slightly ulcerated. It did not have the appearance of hæmoptysis.

The sputum was frequently examined and was always negative to tubercle bacilli.

The blood-counts, while under observation, were:—

|                              | Feb. 12.  | Mar. 3.      | Mar. 18.  |
|------------------------------|-----------|--------------|-----------|
| Leucocytes: Total            | 6,000     | 4,300        | 3,125     |
| Polymorphs, per cent.        | 31.4      | 36.75        | 45.5      |
| Small lymphocytes, per cent. | 52.0      | 29.5         | 37.5      |
| Large lymphocytes, per cent. | 8.0       | 23.75        | 9.0       |
| Transitionals, per cent.     | 8.6       | 10.0         | 8.0       |
| Eosinophiles, "              | 0         | 0            | 0         |
| Red Cells                    | 3,650,000 | 3,570,000    | 3,050,000 |
| Hæmoglobin                   | ...       | 40 per cent. | ...       |

There was some polychromatophilia and the red cells appeared anæmic, small and distorted. The agglutination test against *M. melitensis* was negative. The patient continued in the same condition for weeks. On March 5 the signs had disappeared from the chest, the temperature remained intermittent with a daily rise to 104°F., and the patient appeared flushed.

On March 6 there was some epistaxis from the right nostril, the side on which the ulceration was seen over the inferior turbinate. On March 14 moist râles were again present at both bases. The patient was evacuated to India.

CASE No. 6.—Cooly N., an Indian, aged 30, reported sick in Baghdad on April 1, 1918, with history of a few days' pyrexia and cough. On examination then of the chest it is said that many moist râles and rhonchi were heard scattered over the chest. The spleen is said to have been enlarged and the conjunctivæ yellow and there was diarrhoea. There is no note of the temperature then.

Cysts of *Entamoeba histolytica* were found, and the patient was given five injections of emetine. The temperature was recorded from April 27 and is seen to have been normal from then to May 9 when the patient commenced an intermittent and remittent temperature of inverse type, reaching about 103°F. in the morning, and between 98°F. and 100°F. in the evening. From May 20 to 29 the temperature was again normal, and then again began a similar inverse pyrexia lasting to June 12. After 6 days of apyrexia a similar inverse temperature has re-commenced. The pulse-rate has varied from 100 to 140. The original diarrhoea lasted only a few days, but the jaundice persisted to the end of May, when it cleared. Examined on June 4 the spleen was found enlarged a hand's breadth to the level of the umbilicus and approaching the mid-line. Moist râles and rhonchi were heard on both sides of the chest. The liver appeared of normal size. There was no jaundice. Examination of the stools showed no *E. histolytica* now, and stool-culture was negative to enteric group of organisms. Blood-films showed no parasites. There was deposit of black pigment on both conjunctivæ and on both sides of the tongue. There has been no sputum.

Blood-counts were as follows:—

|                       | June 12. | June 24.  |
|-----------------------|----------|-----------|
| Red cells             | ...      | 3,700,000 |
| Leucocytes: Total     | 3,500    | 4,100     |
| Polymorphs, per cent. | 49       | 57        |
| Lymphocytes, " "      | 51       | 38        |
| Eosinophiles, " "     | 0        | 0         |
| Large mononuclears    | 0        | 5         |

Spleen puncture on June 19 showed no parasites in the material obtained.

CASE No. 7.—Naik S. S., a Sikh soldier, aged 26; one year in Mesopotamia; was admitted to hospital on April 5 and there eventually diagnosed as "Pleurisy." The temperature on admission was remittent, with daily excursions from about 99.4°F. to 103.4°F. and so it continued for a month; then it became more continuous in type, with remissions from 102°F. to 100°F.; from May 26 intermittent; and continuous again from June 10th.

The spleen was easily felt, and on June 8 had enlarged to three fingers' breadth below the costal margin. The base of the right lung was dull to percussion: the breath sounds and vocal resonance were diminished there. Later by June 8 a pleural rub and developed near the top of the left axilla. There was a little sputum which was negative to four examinations for tubercle bacilli and spirochaetes. Blood-films frequently examined showed no parasites. Stool-cultures performed on May 11, May 16, and June 6 were negative to enteric group of organisms. The urine was normal; and there were no other physical signs. Splenic

puncture on June 11 showed no Leishman-Donovan bodies or malarial parasites.

There were a certain number of anchylostome ova in the faeces. Blood counts were as follow:—

|                               | June 11.  | June 18. |
|-------------------------------|-----------|----------|
| Total leucocytes              | 5,900     | 2,800    |
| Polymorphs, per cent.         | 76        | 90       |
| Lymphocytes, " "              | 6         | 6        |
| Hyalines, " "                 | 11        | 0        |
| Large mononuclears, per cent. | 6         | 2.5      |
| Eosinophiles, per cent.       | 1         | 1.5      |
| Red cells                     | 5,200,000 |          |

Two c.c. of this patient's blood injected into a guinea-pig's peritoneum produced no apparent effect in a week's time.

CASE No. 8.—Driver A.D., an Indian soldier, aged 19; eighteen months in Mesopotamia; was admitted to hospital on March 5, 1918, for bronchitis. It is noted then that rhonchi were heard on both sides of the chest and that the spleen was enlarged. The temperature after admission was remittent for four days, then intermittent with a daily excursion from about 97.8°F. to 102.8°F. for nine days, then subnormal for 13 days, then irregularly continuous or intermittent with occasional apyrexial intervals varying from one to five days in length up to the present date (June 20). A four-hourly chart shows that there is a double rise in the 24 hours on many days. There is no further note till his transfer to another hospital on May 26, when it is noted that there are a few râles at the bases of the lungs, that the spleen is enlarged to three fingers' breadth, and the liver to one inch below the costal margin. Seen by me on June 10, there were bronchitic signs in both sides of the chest, the spleen was enlarged a hand's breadth and reached to the level of the umbilicus, and the liver was half an inch below the rib margin. There were patches of black pigment on each side of the tongue. There had been a little sputum, which two examinations had shown to contain no tubercle bacilli; there was no sputum. In spite of his long febrile illness, this patient appeared surprisingly well and cheerful.

Blood examinations were as follow:—

|                       | June 13.  | June 20. |
|-----------------------|-----------|----------|
| Leucocytes: Total     | 4,000     | 3,800    |
| Polymorphs, per cent. | 62        | 70       |
| Lymphocytes, " "      | 27        | 18       |
| Hyalines, " "         | 17        | 11       |
| Eosinophiles, " "     | 1         | 1        |
| Red cells             | 4,600,000 |          |

Stool culture on June 18th was negative to enteric group of organisms. On microscopical examination no anchylostome ova were seen. The urine was normal. Blood films, several times examined, contained no parasites. Quinine was without effect on the temperature. Splenic puncture on June 22 showed no parasites in the material examined.

CASE No. 9.—Sweeper M., an Indian, aged 28; two years in Mesopotamia; is attached to one of the local hospitals, and when he reported sick with fever and diarrhoea was admitted to his own unit on April 21, 1918. He said he had felt ill for two or three days before going sick. The temperature remained irregularly continuous, varying from 99°F. to 102°F. till June 13, and since then has been about 98°F. in the morning and 101°F. in the evening. About May 11 there was an interval of practically normal temperature. The diarrhoea lasted only 5 days and was not severe, the spleen was enlarged to two fingers' breadth below the costal margin and was tender. On May 28th the spleen was larger, being 3 fingers' breadth below the ribs. Blood films were negative to parasites: quinine had no effect on the temperature. The provisional diagnosis was enteric group.

The patient had been inoculated against T. A. B. in February, 1918. Stool-culture on May 29 was negative to enteric group. On June 4 there was a slight cough with scanty sputum. The right base and flank showed deficient air entry and seemed slightly dull to percussion: vocal resonance was increased there. The sputum, examined four times, contained no T. B. On June 11 the chest signs were the same, but the spleen was much smaller and only the tip could be felt. There was some dark pigmentation along the borders of the tongue, and a few slightly enlarged glands were felt behind the left sterno-mastoid.

Blood counts were as follow:—

|              | June 5. | June 15.  | June 23. |
|--------------|---------|-----------|----------|
| Leucocytes:  |         |           |          |
| Total        | .....   | 2,600     | 5,200    |
| Polymorphs,  |         |           |          |
| per cent.    | 33.0    | 50.0      | .....    |
| Lymphocytes  | 66.0    | 50.0      | .....    |
| Eosinophiles | 1.0     | 0.7       | .....    |
| Red cells    | .....   | 5,052,000 | .....    |

On June 13 the urine contained a trace of albumen. On June 15 a guinea-pig was injected intraperitoneally by Lieut. Shanks, R.M.S., with 2 c.c. of this patient's blood. The guinea-pig died after 56 hours, apparently from intussusception of the large bowel. Beyond congestion of the lungs and auricles of the heart no other change was visible. Cultures from the guinea-pig's liver and heart's blood were sterile.

The patient's spleen was now so small that splenic puncture could not be easily performed. On June 19 the respiratory signs were less: there was no dullness, but still somewhat diminished breathing and increased vocal resonance at the right base. There was practically no sputum.

CASE No. 10.—Khalasi R. B., an Indian, aged 32; arrived in Mesopotamia on February 5, 1918, and was admitted to hospital on March 9 with a history of five days' cough and fever before that; so that he was just four weeks in the country before this illness. His illness on admission was diagnosed as broncho-pneumonia. There was dullness at the right base; rhonchi were heard all over the chest and some crepitations at the right base. The tongue was slightly furred and the pulse about 96. There was continuous remittent fever for 2½ months: from May 21, the temperature became intermittent and has remained so till now (June 21), with occasional remittent periods. Bowels have been regular. On March 15 coarse râles were noted over both lungs. Sputum contained no tubercle bacilli: blood films and microscopical examinations of stools were both negative. Stool culture showed no enteric group on April 28. Seen by me on June 20 there was no dull area on percussion of the chest: a few sibilant at the right base and a pleural rub on the left base. A blood count showed:—

|                       | June 20.        |
|-----------------------|-----------------|
| Leucocytes: Total     | ..... 6,300     |
| Polymorphs, per cent. | ..... 84        |
| Lymphocytes, " "      | ..... 9         |
| Hyalines, " "         | ..... 6         |
| Eosinophiles, " "     | ..... 1         |
| Red cells             | ..... 2,400,000 |

The spleen was enlarged a hand's breadth below the ribs, reaching half an inch below the level of the umbilicus. Splenic puncture showed no parasites on June 22. No hepatic enlargement was evident. There were patches of black pigment on the borders of the tongue. The urine was normal. The patient seemed surprisingly well considering he had had over 3½ months of high fever. He was not emaciated and was sitting up in bed enjoying a good meal.

The diseases to which the condition described has most resemblance are kala-azar, pulmonary tuberculosis, and malaria, either singly or a

combination of kala-azar or malaria with tuberculosis. The condition has special resemblance to kala-azar, especially in its long continued pyrexia and in the leucopenia present and in the pigmentation. No Leishman-Donovan parasite, however, has been recovered from spleen or liver puncture either before or after death, though this puncture has been performed by pathologists skilled in the detection of these bodies.

Occasionally one meets patients with mild kala-azar infection from whom the parasite is not obtained in one or two punctures; but this would certainly not be the case in a condition so severe as that described: if the parasite had been present it would have been found. Apart from that the spleen was not so large as would be expected in a series of kala-azar cases. The general appearance was not the same, there was no consistent double rise of temperature in the 24 hours, and the constancy of bronchitis or pleurisy is not a feature of kala-azar.

We may, therefore, with certainty exclude the possibility of these cases above described having kala-azar. Similarly, had malaria been the cause of this condition the parasite or some evidence of its presence should have been found in the blood and amenability to the large doses of quinine would be expected. Nor would malarial infection explain the constancy of the chest signs. A combination, however, of malaria, either old or recent, with active tuberculosis, is more difficult to exclude, since apart from the splenic enlargement pulmonary tuberculosis may give rise to all the signs mentioned. In military tuberculosis itself the spleen may be sufficiently enlarged to be palpable and one such case has already deceived me. From acute military tubercle with absence of bacilli from the sputum and with leucopenia, both of which events are not uncommon, there may be no distinguishing feature, and it may be only the lapse of time and tendency to recovery on the patient's part that will negative that diagnosis. If active pulmonary tubercle is met with in combination with malaria similar signs may be obtained, the malaria contributing the leucopenia and the splenic enlargement to the chest signs of the tuberculosis. In case No. 4 it will be noted that a positive report on the presence of tubercle bacilli was once obtained. The possibility of a laboratory error in this case was mentioned by the pathologist; but if we accept the positive finding, it seems probable, having regard to the case and the temperature chart as a whole, that the tubercle here was a complication.

The principal difficulty in diagnosis of this condition, if it be, as I think, a clinical entity, is from tuberculosis; but at the same time I consider that tuberculosis may be most probably excluded from most of the cases described,



though admitting its possibility in cases Nos. 7 and 9. We have to consider the decided leucopenia, the constant presence of the bronchitic signs and their tendency to the base of the lung and the absence of signs at either apex, as well as the negative findings at the autopsy of the one case. Moreover as regards splenic enlargement the patients have all been medically examined before coming to Mesopotamia and an enlarged spleen would be detected then, unless the examination were unusually lax. So that any splenic enlargement must have been developed in Mesopotamia and, should that be malarial in origin, there should be a previous history of malaria in these cases. Such a history was obtained in only two of the cases.

From fevers of the enteric group and kindred organisms the diagnosis should not be difficult. The pyrexia lasts so long in the condition now described, the tongue is often quite clean or only slightly furred and there is no suggestion of abdominal disease.

Trench fever has been suggested, but there is no clinical resemblance. The urine has always been normal or shown but a slight trace of albumen temporarily in the cases described, so that a diagnosis of chronic pyelitis may be excluded also. The sputum has been examined also in most of the cases for any abnormal presence of spirochætes to exclude the possibility of a chronic bronchial spirochætosis being the cause of the illness. These organisms were not found in numbers greater than might be expected in normal sputum.

Certain other points about the cases are worthy of note. The disease, if we assume it to be an entity, seems sometimes to be of sudden onset, cases 1 and 9; but more often gradual and insidious, cases 2 and 3.

In addition to the total leucopenia, the relative polymorphopenia is also noteworthy: note especially cases 1, 2, 3, 4, and 5 and also how an increase in the total white count and in the number of polymorphs seemed to go with improvement in the patient's general condition. On the other hand the second count in case No. 7 shows a relative polymorph increase, but not an absolute one.

About some of the cases there seems to be a certain periodicity in the course of the fever, *vide* charts of cases 1, 4, and 8; these fluctuations are not explained. Two of the cases given above occurred in the same battalion, and all started in the cold weather or early spring.

Little can be said about treatment. Quinine, salvarsan, antimony tartrate intravenously, and arsenic by the mouth seem to exert no influence on the course of the pyrexia. Moderate doses of potassium iodide have hitherto given most satisfaction.

C. A. S.

#### PATHOLOGICAL DESCRIPTION.

Cases similar to those which form the subject of this paper have occurred from time to time during the course of my investigations in Amarah, but it is only in the last few months that they have been occurring with any frequency, and it is only recently that they have been subjected to more critical, clinical, and pathological study.

Looking back one can recall similar cases which were characterised by long continued pyrexia in which the ordinary causes could be reasonably excluded. The military conditions demanding frequent transfer has in the past also prevented any continuous clinical or pathological study. More recently, owing to the activity of my colleague and his opportunities of supervising a large number of patients it has been possible for me to co-operate with him in a more careful pathological study of these cases.

The disease which was always first suspected and which had to be excluded was that due to the typhoid group of organisms and in some of these patients repeated blood, stool and urine culture has been done without in any one case resulting in the isolation of *B. typhosus* or *B. paratyphosus* A. or B. Although for the first week or two the irregular pyrexia, slow pulse and enlargement of the spleen was in favour of such a diagnosis, it was seen as the case progressed that the question of enteric group of infection could be ruled out.

From time to time we have noted in Amarah blood infection due to the *B. faecalis alkaligines* and on two occasions a cluster of cases occurred, once in a particular billet and another in a camp. The potentialities of this organism are so little known that it was thought possible that these cases might be due to a chronic infection by this member of the typhoid-coli group. One case of continued pyrexia was found to yield an almost pure culture of *B. faecalis alkaligines* in the stools on successive occasions, but this was not found to be so in any of the cases recorded in this paper. I need hardly say that the question of malaria was considered in every case, but the absence of parasites in blood films and in splenic juice and the failure of quinine sufficed to exclude this possibility.

Similarly the blood and spleen juice were always free from spirochætes as far as could be ascertained by the usual methods of staining.

I was inclined to think that some of the cases, particularly the Indians, might be tuberculous in origin, but the examination of the sputum, excepting in one case, was negative to *B. tuberculosis*, and other factors were against this diagnosis. The obvious suggestion in many of the cases was that they were due to *Leishmania* parasites and there are several points in favour of this hypothesis, *e.g.*, the long continued irregular fever, the enlargement of spleen and liver, the



slow but progressive wasting, and the leucopenia with high mononuclear leucocyte percentage. There were several points, however, against this diagnosis, above all the absence of *Leishmania* in the spleen juice during life and in the case examined at the autopsy. With a large experience of kala-azar in India, I have no hesitation in saying that though the diseases resemble one another they are not in my opinion identical, and I do not believe this febrile splenomegaly to be of the nature of kala-azar.

The possibility of the disease being the febrile stage of some trypanosomiasis was also considered, but no evidence was found to support it. Having considered these general diseases there remained to be considered local affection of the liver such as typhoid infection of the bile ducts, suppurative cholangitis, and pre-suppurative hepatitis or liver abscess. Evidence of these conditions were sought for by recognised methods, but neither the pathological examination, the clinical course, nor the effect of treatment bore out either of these diagnoses.

The urine of some of the cases was cultured for organisms on the suspicion that some might be due to urinary tract infection. In two cases Gram-positive staphylococci were found in each of two successive platings, the urine being in each case drawn off under (believed) aseptic precautions. Other cases examined showed no organism. *Micrococcus melitensis* infection was excluded in some cases by absence of agglutinins and by the fact that the coccus was not recovered in culture made from spleen puncture. In no case did spleen puncture show *Leishmania*, malarial parasites or spirochaetes. In one case a small coccus grew on the agar culture and the colony developed a bright coral pink colour. This organism has never been noted in the laboratory before. When injected into the peritoneal cavity of a guinea-pig it gave no result. In another case a small Gram-positive diphtheroid bacillus grew on the agar: that too was non-pathogenic to a guinea-pig.

The correct estimation of the blood picture is not easy to arrive at as the examinations were carried out by a variety of observers. They agree, however, in finding a well-marked, sometimes an extreme, leucopenia with a relative decrease in the polymorphonuclear leucocytes and an increase in the non-granular cells. The large mononuclear percentage is generally high.

#### PATHOLOGICAL NOTES ON SECTIONS.

Portions of the organs from case No. 2 were sent to me. The liver stained with hæmatoxylin showed a large amount of fatty change as evidenced by vacuolation of the liver cells, few of which have escaped this change. There was no cirrhosis and the liver cells stained well and showed no necrosis. The lung presented no very

marked change, though proliferation of the epithelial cells lining the alveoli was in some places a feature.

The adrenals showed no obvious change.

The kidneys showed no gross fibrosis, but some of the glomeruli showed marked shrinkage within the Bowman's capsule. They were congested and showed excess of epithelial nuclei and a few had undergone a hyaloid change. The epithelium of the tubules was healthy except for some cloudy swelling. The spleen showed considerable engorgement with red-blood cells and there was some interstitial fibrosis. There was a large amount of brown pigment scattered through the organ.

The histology of these organs as revealed by hæmatoxylin staining did not therefore throw much light on the disease, but the use of Gram's stain revealed something of much more interest and importance. In the lungs and in the adrenals a considerable amount of delicate mycelium was demonstrated interwoven with the tissue parenchyma. There was no small-celled infiltration round the tufts such as is the case with actinomycosis, but the delicate filaments were found ramifying the tissue. The other organs did not show any mycelium, but in a densely cellular organ like the liver or spleen or such delicate filaments might not be easy to see. A close study of the spleen showed that the pigment granules were quite unlike those deposited in malaria, and I believe them to be conidial granules due to disseminated fungus infection. Since these cases were studied in Amarah, others typical of the disease have been examined in Baghdad and in one case blood culture and culture from the juice revealed a delicate fungus of streptothrix nature which grew well on agar. In broth and in certain sugar media it grew in the form of delicate balls of a beautiful radiating mycelium. The pleomorphism of the parasite on agar is remarkable and it may be that the red coccus and the diphtheroid bacillus recovered from previous spleen punctures were unrecognised coccal and bacillary stages in the life-history of the fungus. The fungus resembles in general and cultural characters that described by Eppinger (1890) as *Discomyces asteroïdes*.\* A fuller description of this parasite is reserved till more work has been done on it. I have shown the sections and cultures to Lieut.-Col. Ledingham, C.M.G., R.A.M.C., the Consulting Bacteriologist of the Baghdad, and he agrees substantially with the

\* More than a year ago, I found a similar fungus tail I was cultivated in a pure state from two different cerebral abscess. In one of these cases the man long course of fever ending in coma and delirium abscess in the brain contained no amœbæ and scales made but only the streptothrix. Conidial pigment around the abscess and widely disseminated in the stump substance of the brain. These cases will fit its artificial a separate note.—F. P. M.

Slight orthopædic cases should not be neglected. Let any medical man so unfortunate as to have an elbow he cannot fully straighten, a forearm he cannot fully supinate or a fist he cannot firmly clench become a preacher of this gospel. These slight cases respond readily and successfully to orthopædic treatment. Cases should not be kept in general hospitals until doctor and patient are alike "tired." One sees too many of the almost "helpless, hopeless" type sent for admission to orthopædic hospitals. Early, efficient treatment is the motto here as with everything else in surgery. Slighter cases should not be retained in general hospitals lulled to a sense of false security by massage and a little faradic battery.

The great practical importance of this early and efficient treatment is that thereby a large proportion of cases (in England they say 75 per cent.) can be sufficiently restored to health and strength to take up military duty again in some capacity.

The orthopædic hospital should be an educational establishment, especially for medical officers, so that when they go to other medical units they may know and be able to apply the principles of orthopædic treatment and will do their part in putting their patients *en route*, with the least possible delay for the orthopædic hospitals.

A special system of case-recording is desirable in an orthopædic hospital.

There is a definite difference between orthopædic hospitals and institutes for disabled soldiers. The latter appropriately arise from civil State action or voluntary beneficence and are for soldiers whose disabilities are determined as permanent—for example amputation cases—where they can be taught an occupation or trade and made into wage-earners. Some overlapping there must be, for it is not always easy to say what is and what is not a permanent disability. The orthopædic hospital and the training institute for the permanently disabled are very usefully territorially adjacent and administratively conjoined. Then the necessary transfers can be made readily and the training workshops of the institute serve to make appliances for, and act as "curative workshops" for, the hospital patients.

## PART II.

The second part of this paper consists of brief notes on the constitution of an orthopædic hospital. It refers only to the surgical work, but orthopædic hospitals have much value for certain medical cases such as neurasthenia, shell shock, paralysis and paresis, "D. A. H.," rheumatism, arthritis and neuralgia.

The hospital shall have 500 beds. It is as accessible by rail as possible, with long, hot railway journeys reduced to a minimum. While there is

plenty of ground for patients' exercise, recreation and physical training, and also for building expansion if necessary, the buildings themselves are compactly grouped and one or more large buildings are useful. This because the patients require strict discipline and want to be constantly under the eyes of responsible people and not too much scattered about. A healthy, bracing spot, with a good all-the-year-round climate, is useful, particularly for the functional and neurasthenic aspects of disabilities. The hospital is fenced in, well away from other buildings, self-contained, *i.e.*, not depending on other hospitals for portions of its work. The wards are cheerful, bright and well-ventilated and the sanitary arrangements good. There are electric lights and fans. Very important is an ample and continuous supply of hot and cold water, and ample electric current available over the whole of the 24 hours.

I will not name the ordinary hospital departments, but here are the more special ones with a few notes on each.

*Electro-therapeutic Department.*—One small room for electrical diagnosis: one large one for treatment. In the diagnosis room are galvanism and faradism and the diagnostic condenser set of Lewis Jones or, better, Hernaman Johnson.

The large room has all the instruments for electrical treatment. "Sample" apparatus is not much good: many patients have to be treated at the same time, each wanting an identical piece of apparatus. Here are galvanism, faradism, tetanising currents, static electricity, sinusoidal baths, high frequency and ionisation.

*Massage Department.*—With this is combined a massage training school. In charge and also head teacher is a thoroughly well trained and competent Sister. A good, intelligent class of pupils is required. The patients themselves can sometimes be trained and massage one another. Framed illustrations of the different processes of massage are appropriately hung picture-wise round the room. Mechanical vibrators and hot-air douches—both electrically driven—are conveniently placed in this department.

*Mechano-therapeutic Department.*—Here, in one large room, are all the different machines for exercising the various parts of the body. Partly here, and partly in the two preceding departments, passive, active, assisted and resisted movements are carried out.

*Measuring Room.*—This is best situated next to the preceding. We have the various "meters," goniometer, dynamometer, and so on, with charts for recording movements of joints. Photographs of patients before and after treatment are hung round the room, *pour encourager les autres*.

*Bath Department.*—This is divided into departments and compartments. Here are douches, massage baths (massage given in the

bath), hot-air (radiant heat) baths, vapour baths, medicated baths, and (most important of all) whirlpool baths. Note that the electric current is necessary. Where medical cases are treated more elaborate bath arrangements are required. There are gowns and a room for dressing and undressing. If there is no central hot-water supply, the boiler house is adjacent.

*Operation Unit.*—Here are aseptic and septic operating theatres and the usual accessory rooms. Some special requirements are an extension table, a Thomas' wrench, special apparatus for testing the electric conductivity of an exposed nerve.

*X-Ray Department.*—This is next to the operation unit with an open corridor between. There are facilities for X-Ray therapeutics which is useful for certain orthopædic conditions; also for operations under the X-Rays.

*Workshops.*—Any real work at a machine, which will at the same time help to overcome deformity, is better for the patient than using a purely mechanical apparatus; so the patients themselves work in the hospital workshops, which then become "curative workshops." They turn handles and work pedals. Instructors and workers in leather, wood and metal are required and further workers are trained here.

*Splint and Appliance Department.*—Next door to the preceding. Here are stocked all comprised under this heading that are required for orthopædic cases. It should not be necessary for a man with a routine disability to wait for his appliance to be made after he gets into hospital. At the start, samples will be required of the more elaborate appliances, from which others can be made.

*Hypnotic Department.*—A quiet room and a medical officer skilled in hypnotism are needed. The atmosphere and methods of "suggestion" treatment should, however, pervade the whole hospital. Hypnotism is also useful for purposes of diagnosis.

*The Wards.*—Cases are grouped according to their nature; e.g., all the fractured femurs together. The medians, the ulnars and the musculo-spirals are all in their different groups. Cases requiring dressing are placed together as far as possible.

In the modern hospital the patient is brought to the dressings, not the dressings to the patient: the advantages are obvious. Orthopædic hospitals should have their central dressing rooms connected with the wards, where dressings and appliances are put on. Beds can be wheeled or carried in, and only in quite exceptional cases should it be necessary to do dressings in the wards.

*Record Room.*—There is a careful system of case-recording on sheets, foolscap size, with special printed headings for the different departments,—

each patient's record in a separate file. The files completed and in use are stored in the record room. Those for patients in the hospital are taken round daily by or with the patient during the treatment period, the necessary entries being made in the different departments.

*Inspection Room.*—Here all new cases are seen and distributed, the general line of treatment being determined. Cases for discharge are seen, their discharge confirmed, and a booklet issued to each giving a statement of the case for taking back to the dépôt or to the institute for the disabled, or eventually to the home as the case may be.

*Recreation Room.*—Large with a stage and folding chairs which can be stacked away, so that the room can be used for physical exercises in the wet weather. Diversified amusements and occupations for the patients are part of their treatment. Men (particularly those who are quite well in themselves), do not respond so readily to treatment when they are feeling bored. Cinema, progressive whist, smoking concerts are good. So is a band, which can also be used for exercises to music.

*Sports Club.*—Athletic competitions with prizes. There are special competitions for special disablements. It all helps to cure, keeping the patients occupied and interested.

*Needlework.*—A most useful occupation for helping to cure disabled fingers is needlework of various kinds, such as is now so often done by soldiers in hospital.

*The Staff.*—So much for departments. With regard to the staff, they are selected for their special knowledge of orthopædic work and should be keen, capable, enthusiastic and hard-working, with confidence in themselves and in their methods. The Commanding Officer is Director of Treatment. His second-in-command is, like him, a general orthopædic expert, and then in charge of the different departments are the various specialists: the electro-therapeutist (who is also electro-diagnostician), the radiographer (who also runs the photographic department), the mechano-therapist (who also has charge of the splint and appliance department and the workshops), the operating surgeon, the balneologist (who becomes more important when medical orthopædics are included). A registrar and two medical officers for general work complete. These last are skilled anaesthetists, and one of the staff is a hypnotist. This makes ten as a permanent officer-staff. Each is as well qualified as possible in the work of all, so that one may be capable of taking another's place. The work of the staff must not be cut up into watertight compartments.

There is a moderate nursing staff, including a massage sister and a theatre-sister. It is well, too, to have sisters in charge of the electric and mechano-therapy departments.

Physical drill instructors, masseurs, and masseuses, X-Ray attendants, electricians, bath attendants, carpenters, leather workers, metal workers (blacksmiths), men skilled in splint and appliance making,—all are specialists on the subordinate staff.

*Training School.*—In addition to the permanent staff there are a variable number of medical officers attached for training and duty. These take charge of cases as ward medical officers and follow them through the different departments, being specially instructed in each. For other attending medical officers classes and demonstrations are held. Medical officers from the front "on leave" should, if possible, have a fortnight additional to spend in an orthopædic hospital. When other hospitals are slack, their medical officers can be sent for training.

The training school idea is carried out through all grades of the hospital staff. In all the special departments are pupils: also some intelligent patients learn while being treated and help in the treatment of others.

*Conclusion.*—The principles of military orthopædics may be summarised as early diagnosis and early continuous treatment in large, specially staffed and specially and completely equipped hospitals. This paper has only dealt with the surgical aspect of the subject, but it is to be recognised that there are a large number of medical cases which benefit by treatment in orthopædic hospitals. The views which have been expressed are doubtless accepted by many, but if they are universally conceded, there will result a consensus of professional opinion which only the profession can evolve and no amount of orders and regulations can produce, which will materially aid and support administrative action. It is to help to bring about such opinion that this paper is written.

The motto of the orthopædic hospital is "Patience and Perseverance." The hospital opens the door of Hope to the disabled and sends to the army and, happily it is to be hoped, later to their own homes and occupations many who, but for its beneficent treatment, would have remained for the rest of their lives maimed pensioners in their country's service.

### THE SYPHILITIC FACTOR IN AORTIC INCOMPETENCE IN BENGALIS.

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DISEASES of the heart and of the arteries (arterio-sclerosis and aneurysm) are almost as

common in Calcutta as they are in London. A brief consideration will show that this must be so. To begin with all forms of congenital defect are as frequently met with as in England, and although scarlet fever is unknown and rheumatic fever not very prevalent, all the other specific infectious diseases of cold climates are met with, in addition to those peculiar to the tropics. As regards the prevalence of rheumatic fever in Calcutta, there has been some misconception in the past, which are however, excusable. Rheumatic fever is a disease of children and young adults. In Calcutta there is no separate children's hospital, until lately no children's wards even, and the young of both sexes are usually treated at home by homœopaths, kabirajes or hakims. Still we have met with young Bengali children suffering from rheumatic chorea with endocarditis (mitral), with rheumatic fever with filrous nodules and endocarditis, and with rheumatic fever with well marked pericarditis and effusion. The cases of heart disease commonly met with in the wards occur in adults, and the form most frequently encountered is incompetence of the aortic valves. The most important cause of this condition amongst Indians is syphilis. To ascertain in what proportion of these cases the spirochæte was present, this enquiry was undertaken. The figures refer to patients admitted into the first physician's wards only, and cases occurring amongst Europeans, Anglo-Indians, Armenians, Jews, Goanese, Chinese, etc., are excluded; as are also those Indian in whom for some reason the Wassermann reaction could not be tested.

|    | Age. | Case. | Sex. | Wassermann. | Hist. of Syphilis. | Hist. of Rheumatic Fever. | REMARKS.   |
|----|------|-------|------|-------------|--------------------|---------------------------|--|
| 1  | 45   | H     | M    | +           |                    |                           | P. M. Sclerosis of Aortic Valves. Sclerotic changes in Aorta.          |
| 2  | 48   | H     | M    | +           |                    |                           |  |
| 3  | 42   | M     | M    | +           |                    |                           |  |
| 4  | 43   | M     | M    | +           | ...                | ...                       |  |
| 5  | 30   | M     | M    | —           | Yes                |                           | P. M. Aortic Valves thickened and sclerosed. Marked Atheroma of Aorta. |
| 6  | 35   | H     | M    | +           |                    |                           |  |
| 7  | 55   | I Ch  | F    | —           |                    |                           |  |
| 8  | 30   | H     | F    | ++          |                    |                           |  |
| 9  | 45   | I Ch  | M    | +++         | ...                | ...                       |  |
| 10 | 30   | M     | M    | —           |                    |                           | Rh. Endocarditis.  |
| 11 | 38   | H     | M    | —           | ...                | Yes                       |  |
| 12 | 51   | H     | M    | —           |                    |                           | Rh. Endocarditis.  |
| 13 | 30   | H     | F    | ++          |                    |                           |  |
| 14 | 27   | H     | F    | + slight    | ...                | Yes                       |  |

|    | Age. | Cast. | Sex. | Wassermann. | Hist. of Syphilis. | Hist. of Rheumatic Fever. | REMARKS.   |
|----|------|-------|------|-------------|--------------------|---------------------------|--|
| 15 | 19   | H     | M    | + slight    | ...                | Yes                       | Rh. Endocarditis.  |
| 16 | 30   | H     | M    | +++         | Yes                | ..                        | P. M. Aortic Valves sclerosed. Extensive Atheroma of Aorta.                                      |
| 17 | 32   | H     | M    | +++         | Yes                | ...                       | P. M. Aortic Valves partly incompetent. Cusps thickened and atheromated. Atheroma of Aortic Aid. |
| 18 | 38   | H     | M    | +++         | ...                | ...                       |  |
| 19 | 45   | H     | F    | —           | ...                | ...                       |  |
| 20 | 55   | H     | M    | +++         | ...                | Yes                       | Rh. Endocarditis.  |
| 21 | 33   | M     | M    | + slight    | ...                | Yes                       |  |
| 22 | 45   | H     | M    | +           | Yes                | ...                       |  |
| 23 | 30   | H     | F    | +++         | Yes                | ...                       |  |
| 24 | 33   | H     | M    | +++         | Yes                | ...                       |  |
| 25 | 24   | H     | M    | +++         | ...                | Yes                       | Malignant Endocarditis.  |
| 26 | 24   | H     | M    | —           | ...                | Yes                       |  |
| 27 | 45   | M     | M    | —           | Yes                | ...                       |  |
| 28 | 15   | H     | M    | ++          | Yes                | ...                       |  |
| 29 | 41   | M     | M    | +++         | Yes                | ...                       |  |
| 30 | 37   | M     | M    | +++         | Yes                | ...                       |  |
| 31 | 32   | H     | M    | +++         | Yes                | ...                       |  |
| 32 | 30   | M     | M    | +++         | ...                | ...                       |  |
| 33 | 32   | M     | M    | +++         | ...                | ...                       |  |
| 34 | 45   | H     | M    | +++         | ...                | Yes                       |  |
| 35 | 33   | H     | M    | —           | ...                | Yes                       |  |
| 36 | 28   | H     | M    | —           | ...                | Yes                       |  |

*Remarks.*—Wassermann reaction: Of the 36 cases examined 26 or 72·2 gave a positive and 10 or 27·8 a negative reaction. Of the 26 positive cases 12 or 46 p.c. were strongly, and 14 or 54 p.c. moderately or slightly positive. Seven cases gave a history of rheumatic fever and of them 4 were Wassermann positive and 3 negative. Of the 36 cases 24 or 66·7 p.c. were Hindus, 10 or 27·8 p.c. Mahomedans, and 2 or 5·5 p.c. Indian Christian. Again 30 or 83·3 p.c. were males and 6 or 16·7 p.c. were females. It is not maintained that in all the Wassermann positive cases the lesion was due to syphilis, but we hold that in all of them syphilis was probably an important, and in the majority the dominant, factor of the case. In every case of aortic incompetence whatever the previous history may be, we deem it advisable that whenever possible the Wassermann reaction should be tested, both with a view to treatment and prognosis, for if it can be established that the patient has got a syphilitic heart, then in our experience whatever treatment be adopted the prognosis is extremely grave.

*Note by W. D. S.*—As is well known, the intravenous administration of organic compounds of arsenic, such as galy and novarsenobenzol is contra-indicated in advanced cardiac and arterial disease. Hence it was not possible to give a provocative injection to those cases in which the

W. R. was negative. Otherwise it is likely that some of the negative results would have become positive. The actual figures then may be taken to be well within the truth as regards the percentage of cases in which lues was the cause of the condition.

### NOTES ON CASES TREATED WITH RADIUM.

By J. C. VAUGHAN,

LT.-COL., I.M.S.,

Civil Surgeon, Ranchi.

THE employment of radium in therapeutics dates from the latter part of the year 1901, when Danlos first employed it in the treatment of cutaneous tuberculosis. Then, somewhat later, Foveau de Courmelles used it, showing its power in allaying the pain in deep-seated cancer. Wickham and Degrais and others followed, but the first "Therapeutic" effect of radium ever noted was the famous "Becquerel burn."

The therapeutic uses of radium have of late aroused a wider interest, and the following few cases which are among the earliest if not the first published in India have, I trust, some interest.

The radium apparatus I have employed has consisted of two Dominici platinum tubes,—each containing 5 m.g. of pure radium sulphate. The walls of these tubes are 0·5 m.m. in thickness;—my total amount of radium has therefore been only 10 m.g.

CASE No. 1.—Papillomatous growth on dorsal aspect of sulcus above glans penis. This was twice removed in the previous 9 months. Excised for the third time and immediately after two radium tubes placed in the wound for 25 minutes without further screening. Application repeated on the two following days; no return of growth observed; patient last seen fifteen months later without any return of growth.

CASE No. 2.—A European lady, aged about 23; an adenoma in breast prior to marriage; removal refused. After marriage growth became uncomfortable; first shown to me when about 7½ months advanced in pregnancy. Growth then a little tender, rather bigger than the body of a large tea-spoon; later on breast inflamed and suppurated and had to be incised. This opportunity taken to bury two radium tubes into mass of the growth for 72 hours continuously. A few days after patient left for Home with instructions to have breast amputated on arrival Home, as she had declined any operation in India. On arrival Home surgeons declined operation as there was no tumour to operate for, patient seen here 10 months after—no growth to be found.

CASE No. 3.—European lady upset a pot of tea on to her knees; result—very extensive keloids in branching lines about 11 inches long over total length on one leg just above knee, and about 7 inches long on the other leg. Keloid growth very painful, so much so that she could not keep standing up for her ordinary occupations without great pain. Treated with radium application of two tubes for from 8 to 12 hours continuously over each part that could be covered by the tubes. The entire keloid was thus treated in sections as it were, the



tubes shifted after each 12 hours or so from one spot to another till the whole area had been radiated again and again. This keloid has now become reduced to a soft scar which is not at all painful and the patient can walk, ride, stand, etc., without any pain or discomfort. There were in this case a good many interruptions in the treatment which was continued for a week to ten days at a time over a few months in all.

CASE No. 4.—An enormous keloid growth of the face, ear, and chest. This was the first keloid I treated, and following Wickham and Degrais, I at first used rather limited radiation: progress was very slow till I adopted 7-hour and 9-hour applications. The results are shown in the illustrations.

The photo, I showed to Dr. Morson in 1914 at the Middlesex Hospital, and in this case the curious point was that the vaccination scars on the arms had taken on keloid enlargement, although they had not been involved in the scald in the scars of which the keloid had grown on the face, ear, and chest. Then later, when treated, the application of radium to the chest was followed by disappearance of the keloid growth in the vaccination scars; and application of radium to the left side of the face was followed by a partial subsidence of the keloid on the right side of the face.

CASE No. 5.—On the 18th September, 1917, an old woman, aged 50, was admitted to hospital with a huge fungating cancer of the left breast measuring some five to six inches across, foul smelling, abundantly fly blown, crawling with maggots. She has besides a large secondary growth in the left axilla as big as good-sized peach and obviously too there was abundant glandular infection, for the arm and forearm and hand and fingers were all markedly swollen and cedematous, obviously from interference with the venous circulation. She was in very poor general health. The cancerous ulcer on the breast was cleaned out with boracic lotion and boracic acid fomentations and turpentine, and on the 21st September the two radium tubes were buried in the mass of the growth. Their position was changed every 72 hours, but radiation was practically continuously maintained. The first photograph was taken on the 25th October, 1917. Her general condition was so bad at the first and the case seemed so absolutely hopeless that my Assistant Surgeon actually omitted to carry out my instructions to photograph the case at the very start because, as he said, he thought she would be dead in a week's time. He now regrets he did not take the earlier photograph, as the size of the growth in the breast had become considerably reduced when the photo of 25th October was taken. The photo of 25th October, 1917, shows the radium tubes in position. The photo of 19th November shows the growth much reduced, and at this time the foetor had quite gone and the arm-swelling was much reduced. A photo taken on the 20th December, 1917, shows the normal wrinkles on the skin and the growth reduced to a nodule on a level with and to the left of the nipple and of about the size of the nipple itself, while in the picture of the 2nd January, 1918, fig. 4, this nodule is reduced to a small fibrous button and the whole of the huge fungating cancer is reduced to an ulcer about  $\frac{1}{4}$  inch across and the breast is soft throughout and the arm-swelling practically all gone. At this stage the patient left the hospital against advice. In this case radium was never applied anywhere but in the growth around the nipple,—never to the growth in the axilla which completely subsided and was in no degree to be felt.

CASE No. 6.—An aboriginal male, aged 45, was admitted to hospital on the 23rd January, 1918, for a malignant growth involving the parotid region of the right side and the whole of the right side of the neck,—with a considerable extent of growth in the left side of the

neck also,—*vide* photographs. This case is such a remarkable one that I give an abstract of the description of the growth as entered by Assistant Surgeon Bimal Kumar Roy, and it is a very correct description of growth on the right side.

A case of malignant growth involving the parotid gland of the right side and the surrounding positions of the neck inoperable.

The patient, an Uraon male, aged 45, was admitted on the 23rd January, 1918; he comes from a very healthy stock, and has not himself suffered from any serious illness, except the present illness which dates back to about 8 months ago, when the patient began to feel weak and debilitated. About four months back he noticed some swelling on the right side of his neck which rapidly increased in size and assumed its present serious proportions.

"The Tumour: Is of an irregular shape,—the size of a man's fist,—extending from below the ear to the nape of the neck where the margin cannot be defined; behind it extends to about an inch and a half of the cervical vertebrae. The whole border of the tumour in this situation is limited by the trapezium muscle and can be more or less clearly defined. Forwards the tumour extends over the angle of the jaw in a more or less diffuse manner. The sterno-mastoid muscle has become wholly incorporated within the tumour mass especially in the lower portion, only its two ends of insertion being distinguishable. The tumour is hard and elastic to the touch and at its lower portions behind, it breaks up into several swellings which are however continuous with the parent tumour. The skin is apparently still free, and a few dilated veins can be seen coursing over the tumour. The sub-maxillary and sub-mental glands are affected and are swollen as also some supraclavicular glands. During the growth of the tumour the patient experienced some dyspnoea, the voice changed and became a little husky, deglutition became a little difficult, and the senses of smell and the hearing were to some extent impaired. There is a constant heavy aching pain in the head, and a certain degree of anorexia has been present for the last three weeks. The patient himself says he has lost much weight during the last four months.

"Radium 5 m.g. in each of two tubes was first buried in the growth on the 27th of January with the aid of a trocar and canula. They were kept in for 72 hours continuously, after which they were re-applied in other parts of the growth. During this time there was not much change in the appearance of the tumour. Only some inflammation round the punctures and the margins of tumour seemed rather less defined. After the expiration of the second 72 hours, when the tubes were again taken out on the 2nd of February, the changes brought about in the tumour were simply marvellous. There was only a slight swelling left of all that had been such a big tumour,—the partially separate parts of the tumour have as it were melted away as also the glandular infiltration. It is no longer possible to take any measurements of the tumour, for there is hardly any tumour left so to speak, and now, after another application of 24 hours, while I am writing these notes, there is hardly anything in the site of the tumour except perhaps a certain fulness in that region of the neck, where once there was such a large growth. The skin about the surrounding region is wrinkled, otherwise there are no changes.

"The tumour on the other side of the neck has not been at all affected. It is a growing tumour, with several of the adjoining glands still enlarged."

On 27th January as above noted, after the first photos had been taken, we buried the radium tubes in the tumour mass, changing their position every 72 hours and giving continuous radiation;—the result is seen in the

photos figured. The glands in the lower part of the neck just above the clavicle and the sub-maxillary and sub-mental glands had not been treated with radium when the photo of the 13th February was taken, and by the 23rd February, one month after first commencing treatment, the entire growth on both sides of the neck had disappeared and nothing was left to feel or see but a small fibrous nodule in the posterior triangle of the neck of the right side, and this is now being further treated. The growth on the left side began to subside about ten days after treatment on the right side was begun, and was considerably reduced when it was also radiated directly, *but the sub-mental and sub-maxillary glands and the glands in the lower part of the neck in the right side have disappeared without direct treatment*,—all but the one nodule now under treatment. Another most remarkable feature is that the voice has become natural; the disturbances in the senses of smell, hearing, and taste have all disappeared and the head pains have also ceased. These latter symptoms,—the neuralgia and the disturbances of special sensation,—we did not know of nor suspect at first until the patient himself told us of them, and he volunteered this information without leading questions and entirely of himself; and he told us of them when his case was being noted and before the treatment was begun. The whole case is a very remarkable one, and I trust I shall be able to follow it up as the patient is a Christian aboriginal and we can always find him.

**OTHER CASES.**—Further case details will only unduly lengthen this paper. I will only add that we have had marked success in treating other conditions including carcinoma uteri, naevi, joint pains in chronic rheumatic conditions, and various other ailments.

Now whereas in these cases there is nothing obviously different from the general experience of treating similar cases with radium, nevertheless certain points, I think, call for observation. The first of these is that, whereas most accounts that one reads are those of cases treated with generous quantities of radium—these have never had more than 10 mg. of radium altogether. A second point is that most records show heavy radiation for short periods with comparatively long intervals. The most remarkable of these cases show the effect of radiation practically continuous, or with only short intervals and all of it comparatively light radiation, and a third point is that three of them at least show definitely the effect that radium seems to have of *affecting even the tumour growths to which it is not directly applied*. It was Dr. Morson, of the Middlesex Hospital, who, I think, first pointed this out. I had not seen his paper, and when in July, 1914, I showed him my work and pointed out this action, he gave me a copy of his paper showing that he had already observed this detail and recorded it, and this curious effect is, I think, one of the most hopeful features in this treatment. One has so often heard it urged that radium treatment may affect the growths one can directly reach but that secondary growths are left unreached and remain unaffected, and it is very little use merely reaching and treating a growth that one can get at if metastatic growths are left to work their own way. Now I do not

by any means suggest that we have proved from the experience of these cases that metastatic growths are entirely and effectively brought under control by radium, or that we have yet shown they can be fully so controlled; but I think we have something good enough to follow up. There is no doubt about the absolute accuracy of Dr. Morson's observation of the fact that metastatic growths do disappear without the direct application of radium to them, and that this observation has abundantly been borne out in my own experience; but what I would emphasize is that in my own experience the most marked subsidence of an obviously very marked growth which was most certainly metastatic and nothing else (*viz.*, the Case No. 5, of mammary cancer with the great growth in the axilla), was a case in which we had the most absolutely continuous radiation of any and with small amounts of radium. Now I submit that it is hardly possible to conceive of a more intense case of cancer infection than this one; yet in the course of  $3\frac{1}{4}$  months (September 25 to January 2) not only was the primary seat of disease practically completely cleared of it, but the huge secondary growth had also disappeared. It raises to my mind the question whether it is not the more correct and rational treatment to radiate, continuously and comparatively mildly, rather than to radiate heavily for short periods separated by long intervals. The great aim of treatment, to my mind, is not only to eradicate such growth as can be got at, but all other growth too, and if metastatic growths do actually suffer dissolution in visible or otherwise appreciable situations, it is reasonable to argue that they may be capable of being resolved in any situation. How do they come to be resolved? Dr. Morson to the best of my recollection,—I can't find his paper,—speaks of altered pabulum, the result of radium action; I would suggest something very similar, that is to say the circulation in the blood of the absorbed elements of breaking down cancer cells (radium disintegration products) and so interfering with cancer growth generally in the body. This is naturally so far only a hypothesis, but it may yet be proved as near correct as can be, and we must bear in mind that it is not merely metastatic cancer that may be thus affected. But in any large cancer growth, where radium rays are not quite capable of reaching equally everywhere, the same may be said to occur,—at any rate when small amounts of radium are used,—in those parts of a large growth which are so remote as not at once to feel directly the disintegrating effects of radium. What I submit is that all growing cancer everywhere, metastatic or otherwise, feels the effect of the addition to the circulating blood and lymph of the disintegration.

products of radium, and this curious effect seems not limited merely to the type of neoplasm included in the various forms of carcinomatous growth in the breast, but seems similarly evident in keloids and in the rapid-growing malignant growth of the lymphatic glands in the neck, noted in Case No. 6, in which one cannot but be very greatly struck with the extraordinarily rapid subsidence of so huge a growth.

I am again bound to admit that this is all very hypothetical, but I give it for what it is worth. Anyway the facts that metastatic cancer and remote keloid growths alike are undoubtedly affected, and disappear *without the direct application of radium to them*, cannot be now gainsaid, and this remarkable phenomenon requires explanation. If there is anything in the hypothesis I put forward, these possibilities of radium treatment open up a remarkable vista.

One other point,—the relation of radium to surgery. There is nothing yet on which we can conclude that in tumour cases radium can take the place of surgery. It cannot; but it can help surgery by making inoperable growths operable. And there is more. All of us know "simple adenoma" which when removed has recurred, and the sequel we all know in too many cases. Case No. 2 was obviously a "simple adenoma" which was just becoming very dangerous when the breast suppurated and the growth was treated with radium—it has vanished and has not recurred for ten months—and there is not a sign of it. Not a conclusive argument it is true, but nevertheless here is food for thought,—would it not always be best in such "simple" cases to excise early and *always to treat with radium at the same time*? If this were always done how many recurrences might be prevented? Such a question can only be solved by further experience with radium. But if radium cannot replace surgery, we are bound to concede it its own high place and acknowledge that it can relieve and cure in cases where the surgeon is powerless and there is no surgery that can accomplish what radium can. It is not a question of antagonism or comparison between the two. Each has its sphere; and they can work together. There are cases where the surgeon must take the lead and radium should only *follow* the knife, but there are also cases where radium must lead and the surgeon's work must follow later; and there are others again, numerous enough unfortunately, where the only relief obtainable, even though it may not always be a cure, is from radium, but among these cases radium holds a good record and is undoubtedly improving it, and daily advancing to the acknowledged position which it is bound eventually to win and to maintain.

In conclusion I would express my acknowledgments to Assistant Surgeon Garib Das Gupta and my most cordial appreciation of the very material help he has given me in this work.

## *A Mirror of Hospital Practice.*

### CLINICAL NOTES FROM GOVERNMENT MATERNITY HOSPITAL, MADRAS.

By C. A. F. HINGSTON, I.M.S.,

*Superintendent.*

THERE are several interesting methods of treatment in this hospital which we find most beneficial to the patients and we think, perhaps, they are not as well known as they might be, so that a few notes might be useful for practitioners.

1. *The treatment of amenorrhœa or scanty periods.*—This is a common complaint, and is often associated with anæmia and a somewhat small uterus. We have for many years now treated patients as follows. The cervix is dilated and the uterus is curetted. Patients are given half-drachm doses of syrupus ferri iodidi three times a day until a period appears. We have always by this method produced some sort of period in young women who have come to us with a history of no periods for months and perhaps for years. We have also recently used iodeol by injection and iodicin by the mouth. We, however, are satisfied that syrup ferri iodidi is the drug to use in such cases. We advise our patients to take it every month for ten days before the period is due. We also advise patients with irregular periods to go through this course of syrup ferri iodidi.

We believe that the cells of the lining mucous membrane of the uterus (the endometrium) have the power of picking up iodine from the blood, and when sufficient iodine has accumulated the woman menstruates. We naturally hesitate to lay down any hard and fast rule of treatment, but as we get such good results now, this treatment should be given a good trial by others.

2. *Dysmenorrhœa.*—A number of unmarried women come to this hospital for painful periods. We recommend *ammonol* in large doses during the periods, ten grains four times a day if necessary. We find that women with painful and scanty periods are more likely to get relief and the periods to become more profuse when *ammonol* is given. We advise patients with profuse and painful periods to take *antikumnia* in large doses during the periods. We find the periods are inclined to be less profuse and much less painful. Of course when we get patients with acute ante-flexion or retro-flexion we advise dilatation up to 19 Mathew Duncan's metal dilators.

3. *Sterility* due to long pointed cervix or pinhole external os, associated with acute ante-flexion or retro-flexion.

We dilate our patients up to 19 Mathew Duncan's and divide the cervix posteriorly by a very useful instrument invented by the late Superintendent of this hospital. We call it the Giffard Cutter, made by Arnold & Sons, London.

4. *Uterine fibroids treated with X-rays.*—This hospital has advocated for the last few years the treatment of small fibroids, and diffuse fibrosis of the uterus with X-rays. We have been very ably assisted by Lieut.-Col. Leet-Palk, I.M.S., (retired), in the treatment of such cases. Our results have been distinctly good. The profuse periods have been stopped completely and the menopause has been brought about in many cases within eight weeks of the treatment. The fibroids have shrunk up. At first we advocated a full dose of X-rays once a week. This necessitated several weeks of treatment. We now recommend a full dose every other day. In some cases 30 doses have been necessary; in others less. We noticed in a few cases that the beneficial changes began to be marked three months after the treatment had been carried out. Two ladies returned for a second course of treatment, and have written to us to say that they are completely cured after the second course. We have had no burning of the skin or any signs of irritation from the X-rays in spite of frequent and large doses. This we consider to be due to the very careful way in which the X-ray treatment has been recommended to be carried out by Lieut.-Col. Leet-Palk.

5. *The use of pessaries.*—We have practically given up using pessaries. We think that pessaries should be used only in the early months of pregnancy in those patients whose uterus becomes retroverted and gives the usual trouble associated with pregnancy and retroversion. In all cases of prolapse of the uterus and in badly retroverted cases we fix our patients' uterus anteriorly to the abdominal wall by three silk sutures. We have had so many cases now of women who have become pregnant after fixation and have gone through labour without the slightest suggestion that the fixation has made the labour any more difficult than normal and we have satisfied ourselves afterwards that in many cases that the uterus has returned to the position it originally was, fixed to the anterior abdominal wall. We have no hesitation in recommending fixation for all cases where there is prolapse or bad retroversion, whatever the age of the patient may be.

6. *Vomiting of pregnancy (Hyperemesis gravidarum).*—We consider that drop doses of tinctura iodi recommended in text-books should be more clearly defined. We think, nothing under four or five drops for a dose is of any use. We recommend that the patient should have her drop-bottle of tincture iodine, and a wineglass of water ready at her bed side, to be taken the first thing when she wakes up in the morning,

four drops for a dose. Those women who often complain of sickness in the afternoon are recommended to take the iodine treatment in the afternoon immediately after sleep, and we recommend all patients to lie still in bed for at least half an hour after taking the iodine. We find that the iodine treatment suggested by us works better if patients are given large quantities of strong coffee to drink a little while after taking the iodine dose, two or three times during the day. Strong coffee in itself seems to be well tolerated by patients in the early months of pregnancy when the sickness is severe.

7. *Eclampsia.*—Bleeding by venesection for eclampsia has been under trial for some months now and appears to be more beneficial than other methods of treatment previously adopted. We believe that venesection has two very important effects:—(1) It reduces the blood pressure. (2) It prevents the lungs from becoming congested and oedematous.

Before this treatment was adopted most of our patients died because their lungs became oedematous, and full of râles and ronchi. Since we have adopted this method, of boldly drawing off blood, we have had no case of lung complication.

Our method of treatment is the following:—The blood pressure of the patient is taken on admission. If found to be above 120 m.m., she is bled until the pressure falls to about 110 m.m. We bleed them to the extent of one pint if necessary. The blood pressure is then taken every 4 hours and if the pressure has arisen again above 120 m.m., we bleed our patient again and bring it well down below 100 m.m. We have brought it down between 80 m.m. and 90 m.m. without any ill-effects.

If the specific gravity of the blood is found to be above 1050 we give saline under the breast; if 1050 or below, we do not give saline. We believe in reducing the temperature of the patient, by iced enemas and *not* wet packs. We always get our patients' bowels open on admission, and in some cases where the women had recently a feed of rice, we wash out the stomach. We have had several very severe cases which have recovered under this treatment. The only one we have lost since we have adopted this treatment was a woman who came in with oedema of lungs and râles and ronchi all over the lungs and chest.

On admission we always give our patients half a grain of morphia acetate hypodermically, and if the patient is getting many fits during the next few hours, we give another  $\frac{1}{4}$  grain.

We consider that the three chief points to be aimed at for the successful treatment of eclampsia are (1) to keep the blood pressure down; (2) to prevent congestion of the lungs; and (3) to keep the temperature down.



8. *The use of Pituitary Extract in labour* has been clearly set out in our report in the *Indian Medical Gazette*, Volume LI (No. 3, March 1916). We have very little to add and nothing to retract.

9. *Treatment of Sæpræmia and Septicæmia.*—This hospital naturally admits a large number of septic cases. They are treated in a special department in the hospital. We use eusol douches and gauze soaked in eusol, which latter is introduced into the uterus and left there for six hours, when the site of the infection is situated in the uterus. Any ulcers of the vagina, cervix or vulva are treated with eusol lotion and gauze soaked in eusol. We have no hesitation in curetting the uterus if we have the slightest suspicion that the placental surface is the site of the infection.

10. *Macerated fetuses.*—It is interesting to note the high percentage of *spirochætæ pallida* found in the livers of the macerated fetuses (*vide* paragraph 15).

11. *Asphyxia neonatorum.*—Some years ago, the then Superintendent, Colonel G. G. Giffard, I.M.S., introduced an injection for giving infants who are born into the world asphyxiated. This injection was first brought to his notice by Dr. Sheel. We call it Sheel's fluid, and it consists of 8 minims of brandy, 1 of tincture belladonna, and 1 of liquor strychn. hydroch. Seven minims of this fluid is immediately injected subcutaneously into the infant in all cases born asphyxiated. It appears to have the power of causing the foetal heart to contract regularly until respiration is established by artificial means. We think that no obstetrician should attend a case without this fluid.

12. *Symphysiotomy and forceps.*—In looking at our annual report, it will be seen that our results are distinctly good. Seven cases were done during the year. Maternal mortality, nil. Six children were born alive and one still. We only do symphysiotomy in those cases which have been handled outside, or when the woman is admitted having been in labour for a long time. We do what we call a high subcutaneous symphysiotomy. We pull the skin well down over the symphysis pubis, introduce the knife midway between the umbilicus and the symphysis pubis and cut down on the symphysis. We do not divide the posterior ligament of the symphysis. After completing our incision, the patient is delivered on the left side. Previous to putting her on the left side, we put a band of plaster strapping round the pelvis. We find, when the forceps are applied, the posterior ligament is ruptured, while the process of extracting the child by the forceps is going on. We do not get tearing of the vagina or other soft parts round the clitoris, which we did in the old method of open symphysiotomy. Our external wound is well above the symphysis and is

exceedingly small. The soft tissues in front of the symphysis pubis are hardly injured at all. This prevents sudden tearing and opening out of the symphysis suddenly, and so there is much less likelihood of injury to the bladder, urethra and soft parts, which does take place in the open method.

13. *Abdominal sections.*—It may be interesting to the surgeons practising in abdominal surgery in this country to know that we use nothing but silk for our sutures and ligatures inside the abdomen, and that we close all our abdominal wounds by through and through silk sutures in one layer, which includes peritoneum, muscles, fascia and skin. In spite of this, we very seldom see a patient returning with an abdominal hernia. We can only remember two cases within the last five years.

14. *Anæsthetics.*—During the last two years it is the routine practice of this hospital for the anæsthetist to give patients inhalations of spiritus ammonia aromaticus as soon as chloroform inhalations are stopped. We find by this excellent suggestion, that very few of our patients suffer from chloroform sickness. We have no hesitation in suggesting this to be taken up by the practitioner. Patients are sometimes given spiritus ammonia aromaticus for 20 minutes or half an hour after severe operations.

15. *Bacteriological department.*—(a) Many cases of anæmia during pregnancy were subjected to a complete examination, blood, urine, motions, etc., but most of them, about 99 per cent., proved to be due to *ankylostoma duodenale*.

(b) Livers of macerated fetuses were examined pathologically with a view to observe how many of the intra-uterine deaths of fetuses were due to syphilis. Of 44 livers, 14 showed the presence of *spirochætæ pallida*. Only one patient remained in the hospital to undergo salvarsan treatment.

(c) Blood of 50 patients were examined for syphilis by Wassermann's reaction, and only 20 were positive. These cases were mostly of repeated abortions, erosions of cervix, etc. Only two patients underwent salvarsan treatment.

(d) Vaccine treatment, both stock and autogenous vaccines, was carried out for the following diseases:—

- (a) *Streptococcus* ... for puerperal sepsis.
- (b) *Bacillus coli* ... " puerperal sepsis and cystitis.
- (c) *Genococcus* ... " gonorrhœal vaginitis and rheumatism.
- (d) *Pemphigus* ... not used.
- (e) *Staphylococcus* ... for furunculosis and acne.

The doses administered were according to instructions received from the Director of King Institute, Guindy.

*Results.*—But for one interesting case of *B. coli* septicæmia, for which *B. coli* vaccine was



used, and for a few cases of gonorrhoea and rheumatism, which were relieved by gonococcus vaccine, vaccines did not appear to be of much benefit to the patient.

*Case Notes.*—Reg. No. 54—Dhanam—female, 20 years. First pregnancy. Placenta prævia, delivered by perforation of foetal head and extraction. Subsequent bacillus coli septicæmia of a very severe type. Admitted on 30th January, 1917, delivered on 31st January, 1917, and discharged on 2nd February, 1917. Temperature rose up on 2nd February, 1917 (third day after confinement), to 103·4° Fah. Diurnal variation of two to four degrees were observed during the succeeding four days, the fever remaining one of a remittent type. On the seventh the temperature rose to 104·0° Fah., and dropped in the afternoon to 99·0° Fah. There was a distinct rigor premonitory to the fever. During this week the lochia became offensive and the patient was treated with hot eusol douches and ergot mixture. On the seventh the uterus was still midway between umbilicus and pubis and the discharge offensive. On exploring the uterine cavity, pus was found and the cavity was douched with eusol lotion and packed with eusol gauze after swabbing with tincture of iodine. On the sixteenth, condition improved much, temperature falling to normal and discharge less offensive. On the next day temperature began to rise again and kept above normal with rigor, coming on daily. The same method of treatment was followed. The patient even had septic diarrhoea on the 14th February, 1917. The patient was then tried with streptococcal polyvalent vaccine, but not to any benefit. Pyometra remained persistent with consequence of septic fever and subinvolution. Blood examination showed no malaria but an absolute leucocytosis, mainly of the polymorphonuclears with an increase of eosinophiles. Patient was tried for worms, but to no effect. A trial to polyvalent streptococcal serum was given, and urotropine prescribed as she developed cystitis. The patient had no great improvement. Then she was placed on quinine injection, which was of no use. Then B. coli vaccine was tried, commencing with five million. In a few days the patient showed considerable improvement and after a fortnight's apyrexia was discharged as cured.

16. *Death-rate.*—The death-rate in abdominal sections is 5·7, and compared with those of the last five years is satisfactory—

|      |     |     |      |                        |
|------|-----|-----|------|------------------------|
| 1913 | ... | ... | 12·3 | in non-malignant case. |
| 1914 | ... | ... | 8·1  | " "                    |
| 1915 | ... | ... | 8·3  | " "                    |
| 1916 | ... | ... | 5·5  | " "                    |
| 1917 | ... | ... | 5·7  | " "                    |

We do not compare our percentage of deaths with those in Europe, the conditions are so

different. Women come to us with fibroid tumours which have caused profuse menorrhagia for some years, intense anæmia, when intestinal obstruction or suppuration of the tumour takes place; then only do a number of them seek advice. We never get an early case of cancer. The majority of those suffering with pyosalpinx arrive here with a large abscess cavity in the pelvis and high temperatures. We are glad that our percentage of deaths is so low, taking into consideration the wretched condition of our patients.

17. *Administration*—(A) *Medical staff.*—For the first five months in the year Col. G. G. Giffard, I.M.S., who returned temporarily from military duty, was in charge of the hospital. Major C. A. F. Hingston, I.M.S., who has been in charge of the hospital during 1914, 1915, and 1916, resumed charge again on the 1st of June, 1917, when Col. G. G. Giffard, I.M.S., reverted again to military duty. The Superintendent is very ably assisted by Dr. S. Rangachari, M.B., C.M., Assistant Superintendent, Dr. C. T. Verghese, L.M.S., Resident Medical Officer, Dr. A. L. Anantanarayana Ayyar, M.B., B.S., in charge of the septic side of the hospital, and Dr. A. Srinivasulu Nayudu, B.A., L.M.S. (Madras), L.M.S. (Bombay), in charge of the bacteriological section.

The work of the hospital still continues to be appreciated by the public, who come here in large numbers from the mufassal, other provinces, Singapore, Ceylon, and Burma.

(B) *Nursing staff.*—The matron went on leave in August and September, 1917, and Mrs. F. M. Guy, C.M.B., assistant matron, has been carrying on the work of the matron. We have for our staff a matron, a night superintendent and 13 permanent European staff nurses. About 40 probationary European pupil nurses are under training. The Indian staff consists of 11 Indian staff nurses, and 65 Indian pupil nurses under training. The nursing staff is quartered in the Lady Lawley Institution, in Haliburton's Gardens, close to the hospital. Excellent quarters have been provided for all.

(C) *The school.*—The Giffard School, which is the training school for the University students, post-graduates, and the nurses, is used to its fullest extent. During the year Col. G. G. Giffard, I.M.S., delivered a very valuable course of lectures to over a hundred post-graduates from the mufassal and Madras. These lectures are likely to be repeated every year.

I have to thank the staff for the assistance they have given me in the gynæcological and the maternity departments of the hospital.

MADRAS,  
May, 1918.

## A CASE OF PRIMARY ABSCESS OF THE SPLEEN.

By J. WINTERBOTHAM, M.D.,  
Mysore.

ABSCESS of the spleen is sufficiently uncommon, we think, to make the following case worth recording. On the subject of abscess of the spleen, Kelly and Noble in *Gynaecology and Abdominal Surgery* say "the formation of abscesses in the spleen in cases of pyæmia is a common occurrence, but such abscesses are usually small, and not recognizable during the life of the patient. Primary abscess in the spleen is rare. Douglas gives a résumé of seven cases reported by Bessel Hagen and adds three others. The origin of splenic abscess is frequently most obscure; a few have followed blows, and the case referred to under movable kidney followed a twisting of the splenic pedicle." In Watson Cheyne's *Manual of Surgical Treatment* we find "an abscess of the spleen occasionally occurs as an independent affection—for instance after typhoid fever—but its diagnosis is extremely difficult."

The patient, a Hindu, of the Kumma caste, aged about 30, and a small farmer, was admitted to the hospital here on April 9, 1918, complaining of pain in the left side and a little fever. On being carefully questioned the following history was obtained:—

*History.*—Rather over four months ago the patient was seized with plague and developed a bubo in the right axilla. He got perfectly well and for nearly three months went about his work in the fields. A month ago he felt a sharp pain in the left side under the ribs when taking a deep breath. This has gradually got worse. Fifteen days ago he noticed a swelling over the lower ribs on the left side, where the pain was. He has been having some fever since the swelling was noticed. He does not remember having any illness before the plague beyond occasional "fever." He knows of no blow or anything that could have acted as an exciting cause.

*Present state.*—On admission we found that the patient, who was a well-built and healthy-looking man, well covered though said to be thinner than he had been, had a swelling in the lower part of the left side of his thorax. This extended from the 7th rib above to the costal margin below and from the posterior axillary line behind to within 2" of the middle line in front. The swelling bulged the rib slightly and the intercostal spaces were filled out; it was painful and very tender on pressure; there was slight œdema over it. It was absolutely dull on percussion.

The left side of the chest moved rather less than the right side at the base and the breath sounds were not quite so distinctly heard. There were no adventitious sounds in the chest. The heart was normal in position and the cardiac dullness and heart sounds were normal. There

was nothing noteworthy in the abdomen or other parts of the body beyond the scar of the bubo in the right axilla. The urine was acid with a specific gravity of 1015 and contained nothing abnormal. The temperature was normal in the morning and raised to 100°F. the first evening and 99.6°F. the second evening.

Although, seeing the rareness of the condition, we were doubtful of the diagnosis of splenic abscess, as it seemed certain that there must be pus and the patient was in a good deal of pain, we decided to operate without delay and on the third day after admission this was done.

Chloroform was administered, and then as it was impossible to get at the abscess from below the ribs, an incision was made 4½" long over the 8th rib, which seemed to be the most prominent part of the tumour. The incision started slightly behind the mid-axillary line and extended in front of the anterior axillary line. About 1½" of the rib was resected. As the reflection of the pleura here may come as much as four inches below the level of the lung, as a precautionary measure stitches were inserted to close off the pleural cavity in case that had not been already done by adhesions. After this a hypodermic needle was pushed into the tumour, which could be felt between a finger in the wound and the other hand pressed up under the costal margin. Pus was withdrawn by the syringe, some of which was at once put into two agar slope culture tubes, and two slides were also spread for immediate examination. (We have found on several occasions Baird and Tatlock's "solmedia" most convenient for making culture tubes, as we use these only occasionally.) Sinus forceps were then pushed in in the track of the needle and on opening them pus gushed out. The hole was enlarged with dressing forceps and the gloved finger was inserted. There was no doubt that the abscess cavity was in the substance of the spleen; the finger could be pushed forward to within about ¾" of the costal margin and also upwards and a little backwards. About six ounces of yellowish pus mixed with broken-down spleen tissue, as confirmed by microscopic examination, was evacuated and a rubber drainage tube inserted. Four silkworm-gut sutures were inserted to draw the skin and muscles together and the wound dressed with sterile gauze and wool.

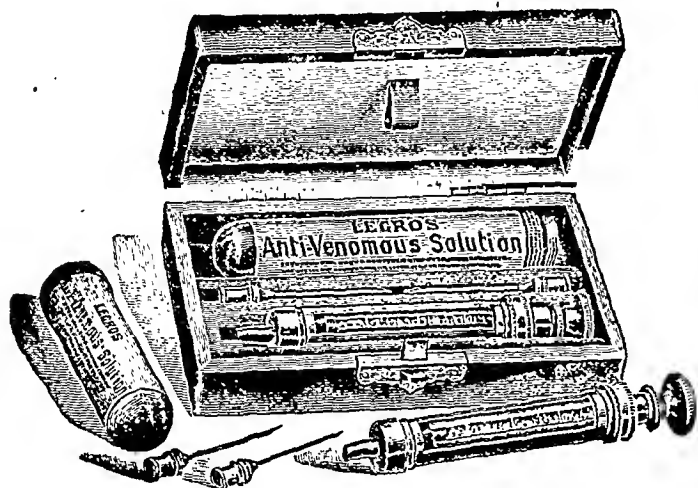
The tube was removed on the second day, that is, two full days after the operation, as there was only a little serous discharge.

The patient was discharged after eighteen days with the wound practically healed, after an uneventful convalescence.

From the pus in the agar slopes a pure culture of staphylococcus, apparently pyogenes albus, was obtained. The slides showed these organisms mixed with broken-down spleen tissue.

## Rational Scientific Treatment of Bites of Venomous Serpents or Stings of Venomous Insects on Man and Animals.

### THEIR CURE—



BY THE USE OF—

## Michel Legros' Outfit

Dr. Michel Legros' Outfit is put up in a strong little case (3.2 x 1.6 x 0.8 in.) and weighs 1 oz. It takes up no more room in the pocket than an ordinary match-box, and can therefore be carried without inconvenience.

Dr. Michel Legros' Outfit contains—

- 1 Tube of Solution for four injections.
- 1 strong metal-mounted Syringe.
- 2 adequate Needles.

Dr. Michel Legros' Solution is always effective and may be kept any length of time.

Separate Tubes of Solution are supplied at very moderate prices.

FULL DIRECTIONS SUPPLIED WITH EACH TUBE OR OUTFIT.

## Rational Treatment of Constipation

By the double action of Secretions and Peristalsis.

## OPOLAXYL

Opolaxyl is a combination of the secretions of the liver (biliary), pancreas, and intestines, with vegetable extract of a non-drastring nature.

It combines all the secretions to correspond to nature's therapy, and promotes a flow of bile and glycogen with their hæmatopoietic and antitoxic properties.

It is a normal regulator of the gastro-intestinal functions; consequently it improves the metabolic exchanges in the entire organism.

DOSE.—For obstinate constipation 2 or 3 tablets, afterwards 1 tablet every 3 or 4 days for a month.

### LEGROS' SOLUTION AND SNAKE BITES.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I beg to send you notes on the use of Michel Legros' Anti-Venomous Solution in cases of snake-bite, which may be kindly inserted in the *Indian Medical Gazette*.

Recently I was called to see a case of snake-bite. A boy, aged about 18, was bitten on his right foot by a cobra at about 7 A.M. The patient immediately after the bite tied a ligature tightly round the leg below the knee with a rope which he carried with him for his cattle, and cried aloud for help. His neighbours hurried up to the place and killed the serpent, which lay hidden in an adjacent bush. The serpent was 4½ feet long, and its diameter at the middle was 5½ inches; many native *ojhas* assembled and tried their *mantras*. At about 8.30 A.M. symptoms of poisoning developed, notwithstanding the three additional ligatures tied by the men subsequently. I reached the place at 9 A.M., when the condition of the patient was as follows:—Eyes opened and turned upwards, the tongue fixed between the teeth which could not be separated, the heart's beat was very feeble, limbs cold. At once I injected 15 minims of Anti-Venomous Solution on the right forearm and 15 minims in two places on the right thigh, which was much swollen. After ten minutes I again injected 10 minims into the left forearm and 15 minims in two places near the site of the bite, and made several incisions near the site of inoculation and freely rubbed in crystals of Pot. Permang. I left the patient at 1.30 P.M., when he could speak with ease and all the symptoms had considerably subsided. He only complained of severe pain in his right leg, for which I prescribed hot Permang. bath. Next morning the patient was all right.

From the above it will appear that the life of the patient was saved by Michel Legros' Anti-Venomous Solution.

It is a very simple remedy, administration of which requires no special skill; my tube of solution was about a year old, and I understand the solution keeps well for several years.

The following points are most important:—The venom is not, as a rule, carried immediately in its entirety into the circulation (except in cases when the bite has penetrated into a vein, in such cases death may be caused immediately). The venom first reaches the small blood vessels, by its own action on blood the local circulation is arrested, and this prevents the immediate diffusion of the poison throughout the organism.

When the poisoning symptoms have already developed, a dose should be injected into the healthier tissues above the wound and swollen parts. Another should be given in two or three places near the site of the bite. This may be repeated if the condition of the patient becomes more grave. The solution must be injected deeply into the tissues for rapid absorption. Medical practitioners can easily and conveniently carry a tube of solution containing four doses at the nominal cost of Rs. 4 per tube.

BINODPUR, JESSORE,

20th June, 1917.

Yours, etc.,

S. G.,

Medical Practitioner.

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## The Combined Treatment of SYPHILIS.

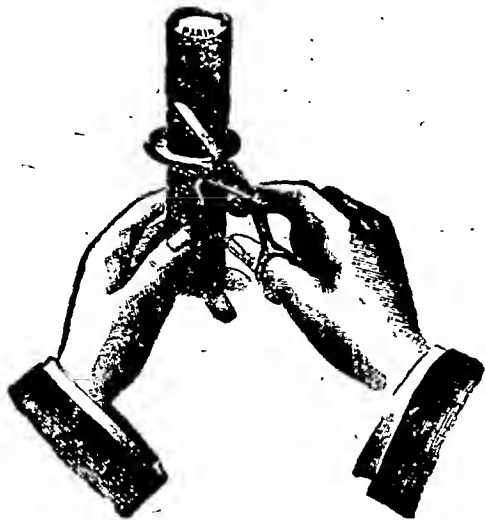
**SUPSALVS**STABLE SUPPOSITORIES OF  
"606" (of French Manufacture)

FIG. 1.

Fig. 1 represents the special patent metallic envelope containing a Supsalv for hot climates. The projecting edge in the middle is cut by scissors—the two ends are then easily pulled apart. The envelope should first be immersed in cool or iced water for 10 minutes.

At the International Congress of Medicine Ehrlich stated that the biochemical action of "606" on spirochaetes is not direct but indirect, a third factor found in the body fluids being necessary.

This success is explained by the well-known experiment of Levaditi: "If living treponemas be placed in a solution of Arsenobenzol (Ehrlich's 606) they continue to live in it. But if a trace of extract of liver be added to the mixture the treponemas are destroyed."

"If 606 has to be taken up and transformed by the liver in order to become toxic to the treponema, there is no better mode of absorption of the drug than by way of the intestine, since all the veins of the intestines join the portal vein. If this be the case no route could be more indirect and more unsatisfactory for active treatment than one that is not intestinal or not intravenous (i.e., prehepatic), since some of the drug must necessarily become fixed everywhere before the passage through the liver has activated it."—Dr. Sabouraud, La Clinique (13-4-1913).

As a result of numerous clinical experiments, Dr. Bagrov, of Moscow, has arrived at the same conclusion, and recommends the rectal method of administration of 606.

200 cases were treated by the combined treatment in one of the London hospitals. In each case a negative reaction was attained.

Extremely Simple in  
Use.

No Ill-effects.

Most Satisfactory  
Clinical Results.

Rapid Absorption.

**MERSALV**FOR MERCURIAL INUNOTION IN  
CONNECTION WITH SUPSALVS  
TREATMENT.

**CHEMISTRY.**—"Mersalv" contains 10 per cent. metallic mercury, which by a special mechanical process exists in the minutest state of sub-division possible. It is a non-greasy preparation, and, in contra-distinction to other mercurial preparations, contains no organic fats or oils. "Mersalv" is of a white creamy consistence, of pleasant odour, and cleanly in application.

In Special Glass Stoppered Bottles for Hot Climates.

**IODOGÉNOL**

IODINE in its Most Reliable and Palatable Form.

**IODOGÉNOL** is a preparation containing Iodine in an organic, assimilable and one might almost say "living" form.

**IODOGÉNOL** possesses about 38 times the physiological activity of that of iodide of potassium, this preparation has, according to the clinical reports of eminent professors, succeeded where the usual iodide treatment had failed after producing undesirable by-effects.

**IODOGÉNOL** does not produce Iodism or other bad symptoms.

**IODOGÉNOL** is an undoubted digestive stimulant and promotes appetite and has a markedly beneficial effect on the general nutrition. It has been tried in many of the large hospitals, and given highly satisfactory clinical results in cases of

Syphilis, Rheumatism, the various phases  
of Tuberculosis, General Debility, etc.

20 minims of IODOGÉNOL are equivalent to 8 grs. Iodide Potassium.

The SCIENTIFIC TREATMENT OF MALARIA,  
INFLUENZA AND ALLIED AILMENTS.**KINECTINE**

According to Dr. MOUNEYRAT, the discoverer of Galy and Hectine (the widely adopted Salvarsan Substitutes).

**FORMULA:**

Chlorhydrate of Quinine c. Hectine—i.e., Benzo sulfone-para-amino-phenyl-arsenate of Quinine.

Non-toxic, produces no ill-results.

Easily taken (tablets) and well tolerated.

Highly satisfactory clinical results.

Not only a Prophylactic against, but a Specific in,  
**INFLUENZA, Catarrh, Coryza, Hay Fever, Malaria, etc.**

H.M.S. —, 27-7-17.

SIR,—I enclose P.O. for the tube of Kinctine. The drug has given every satisfaction.

W. B. H. W., Surgeon, R.N.

The Anglo-French Drug Co., Ltd., Holborn, London, E.C.

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# IODARGOL

**NON-TOXIC  
PAINLESS**

Special Colloidal Iodine.  
**FOR THE TREATMENT**  
of Gonorrhœa: Acute and  
Chronic. Urethritis: Of  
Old Standing.

**DIFFUSIBLE  
ANTISEPTIC  
ANALGESIC**

Cystitis and the Serious Complications of Gonorrhœa.  
In Ampoules and Phials for Injection or Soluble Bougies.

## FOR GYNÆCOLOGY OVULES

**UTERO-TOPIQUE**  
**IODARGOL.** Direct Intra-  
uterine Medication.

These are introduced into  
the vagina and slowly dis-  
charge the Iodine which  
penetrates deeply into the  
vaginal mucous membrane,  
giving rapid relief from con-  
gestion and pain. Destruc-  
tive to the micro-organisms.

As a wound dressing Iodargol on account of its antitoxic and  
dermoplastic action prevents or ameliorates the fever due to infection,  
cuts short suppuration, eliminates the sloughing portions and cleans  
the wound, at the same time stimulating epidermisation and  
cicatrisation.

**IODEOL OVULES** for Vaginitis, Metritis, etc.

**IODEOL CAPSULES** contain 4 grains of Iodine in each.  
Never cause Iodism.

*More powerful and active than Iodine without its  
drawbacks.*

The treatment of Carbuncles, Boils, Anthrax,  
Acne, Styes, and diseases arising from  
**STAPHYLOCOCCUS.**

# STANNOXYL

*(An Oxide of Tin and Tin Meal  
free from Lead.)*

A truly scientific production the value of which  
has been studied very closely. The effect is really  
wonderful; from the second day of treatment the  
pain is relieved and the carbuncles begin to dry up,  
those which are just opening are stopped in their  
course; the core is not expelled but reabsorbed.

In the majority of cases a complete cure is  
effected by the fifth or sixth day, it is seldom  
necessary to take the full 10 days' treatment, and  
relapses are unknown, indeed it is a specific for  
diseases arising from Staphylococcus.

The daily dose for Adults is 4 to 8 tablets;  
Children, 2 to 4 tablets.

*Supplied in vials of 80 tablets.*

# URASEPTINE

**The Most Powerful and Effective  
Urinary Antiseptic.**

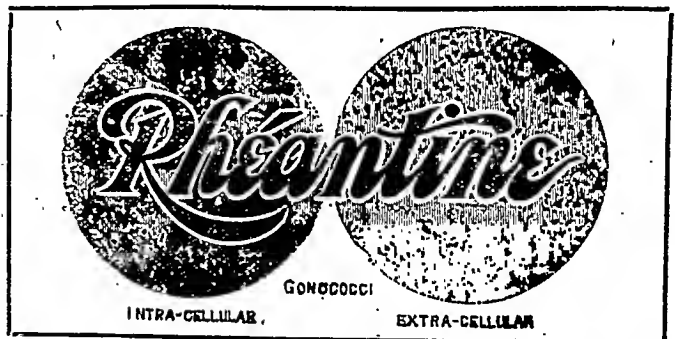
**URASEPTINE** is a granulated product entirely  
soluble in water, its bases being Piperazine, Urotropine,  
Helmitol, Benzoates of Sodium and Lithium. It contains 60  
centigrams (10 grs.) of active matter to each teaspoonful.  
Dose.—2—6 teaspoonfuls daily.

It purifies the Urine, and this action is due to its three  
principal properties:

1. It is a **URINARY ANTISEPTIC.**
2. A **SOLVENT** of **URIC ACID** and of  
**PHOSPHATES.**
3. A **MILD NON-TOXIC DIURETIC.**

**INDICATIONS.**—Arthritism, Gout, Gravel, Hepatic and  
Renal Colic, Rheumatism, Calculus, etc., Phosphaturia,  
Urinary Antisepsis, Pyelitis, Bacteriuria, Cystitis, Prostatitis,  
Urethritis, Pyuria, Urinary Abscess, Vesical Catarrh, etc.

## ANTIGONOCOCCIC



The clinical reports given by various doctors show that  
Rheantine gives highly satisfactory results, both in acute  
and chronic forms of Gonorrhœa and also in the various  
infectious complications due to Neisser's bacillus.

Rhéantine is put up in hermetically sealed tins, containing  
28 spherules. Dosage.—4 spherules a day.

Therapeutic Association of Paris (14th June, 1916): the result of  
their observations:—

"It is not a rare thing," write these authors, "to observe in the  
very first days a more or less marked recrudescence of the  
discharge. This negative phase, which, however, is temporary,  
is always followed by a well-defined positive phase, in the course  
of which the characteristics of the urethral pus undergo a rapid  
change; the discharge, which is at first thick, abundant, and  
creamy, passes gradually into the hyaline state, diminishes in  
quantity, and in the majority of cases ceases."

"Under the microscope these successive stages are demonstrat-  
ed in equally definite stages; whatever may have been the  
duration of the disease, the characteristics of the pus become  
rapidly modified; after two or three days' treatment the gono-  
coccus, first intracellular, becomes exterior; it ceases to act as a  
parasite on the polynuclear leucocytes and the large epithelial  
cells—one then finds them disseminated outside the leucocytes."

"Finally, some days later, if the administration of Rheantine  
is continued, the condition undergoes still further change, the  
gonococci become agglutinated, arranged in a mass, and finally  
bacteriolysed."

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# NEOCAINE-SURRENINE

Neocaine is a synthetic product of French manufacture.

A Perfect **COCAINE SUBSTITUTE** of Low Toxicity.

A White Powder, readily soluble in water. Analgesic power, duration, and rapidity of action quite equal to Cocaine.

Toxicity less than one-sixth.

Therapeutical effects identical with Cocaine (excepting as an exhilarant) for Dental or Surgical, local and Spinal Anæsthesia, Lozenges, Snuffs, Ointments, &c.

## Composition of Neocaine-Surrenine :

|                                     |     |     |          |
|-------------------------------------|-----|-----|----------|
| Pure Neocaine                       | ... | ... | 5 c.g.   |
| Acid Borate of Adrenalin (Takamine) | ... | ... | 0.1 m.g. |

Pure Neocaine is also supplied.

FORMS.—Powder in capsules and phials. Ready prepared solutions in Ampoules (various percentages), and Ampoules of sterilised liquid for making solutions.

## THE MEDICAL TREATMENT OF CANCER.

# CUPRASE

CUPRASE is a colloidal copper hydroxide which is obtained chemically by the reduction of salts of copper in the presence of albuminosic acid.

As a result of over ten years' research work on Cancer, Dr. Gaube du Gers produced a new Colloidal Copper Hydroxide which has given remarkable results in *arresting the progress of the disease*, with loss of pain, and great improvement in the general condition of the patient.

The numerous clinical reports from Doctors of repute in various countries, give cases of a great variety. In all of these pain has been eliminated, and a good percentage of cures are claimed, and in no instance any undesirable effects.

Its easy application (intramuscular injections) places it within the reach of all practitioners. It is not toxic.

Disappearance of the Pain.

Return of Sleep.

Increase of Appetite.

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Supplied in boxes of 8 ampoules.

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DEAR SIR,—Will you please send me another box of Cuprase ampoules. The previous lot effected a most remarkable cure in an elderly lady suffering from cervical cancer—the cauliflower-like growth has disappeared with its offensive discharge.

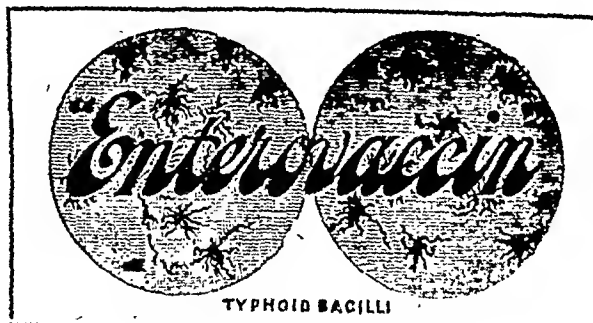
This case was given three months' life by a Specialist, being inoperable.

Yours faithfully,

(Signed) B—B—, M.R.C.S., L.R.C.P.

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The results of **4,000** applications of **Enterovaccin** carried out by approximately 200 Doctors are as follows :

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300 millions Eberth bacilli. 180 millions coli bacilli.  
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Each capsule contains 4 grains of Colloidal Iodine in the most minute form of subdivision known.

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INJECTION**

for

**Pneumococcal Disease**  
—Simple and Infective

and

**Broncho-Pneumonia**

**Bronchitis**

**Pulmonary Congestion**  
**TUBERCULOSIS, &c.**

**By the Mouth (Capsules) :**

**Syphilis**, or wherever Iodides are indicated. **Iodeol** is ten times more active and does not cause Iodism.

**Externally (Liquid) :**

Contains 50 per cent. Colloidal Iodine (must not be used for injection), ten times more active than painting with Iodine tincture—does not produce erythema or irritation. Absorption is extremely rapid.

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These are introduced into the vagina, slowly discharge the iodine which penetrates deeply into the vaginal mucous membrane, giving rapid relief from congestion and pain.

Destructive to the micro-organisms.

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## Indian Medical Gazette.

-SEPTEMBER.

## THE THOROUGH TREATMENT OF MALARIA.

THIS subject is receiving much attention at the present day. In July we published the results of the investigations conducted under Sir Ronald Ross; now we have before us a series of articles (from the *Annals of Tropical Medicine*) by Lt.-Col. J. W. W. Stephens and his colleagues at Liverpool.

We can only here give the names and very short notes of the various articles:—

1. Intravenous injections of tartar emetic (said to be useless in malaria).
2. Intramuscular injections of quinine bihydrochloride (useful, but temporary).
3. Intravenous injections of quinine bihydrochloride (effects a temporary cure).
4. Intramuscular injections of amylopsin and trypsin (of no value in acute simple tertian malaria).
5. Intramuscular injections of quinine alkaloid (*i.e.*, quinine in an insoluble form), useful but temporary.
6. Oral administration of quinine for two consecutive days only.

"Oral administration of quinine sulphate in doses of grains 10 or more on each of two consecutive days causes the cessation of febrile paroxysms and effects the disappearance of all stages of the parasite from the cutaneous blood in simple tertian malaria. If the dose given on each of the two days does not exceed grains 30 no curative effect is obtained, a relapse occurring within two to three weeks. When the dose given on each of the two days reaches grains 45 or more, a curative effect is manifest. This becomes more marked as the dose is increased from grains 45 to grains 90. The maximum dose of grains 90 on each of two consecutive days prevents 62 per cent. of cases relapsing within an observation period varying from fifty-three to one hundred and sixty-five days."

7. Oral administration of quinine sulphate daily over prolonged periods.

45 grains daily gives the best results up to eight weeks,—gives best results as regards permanent cure and avoidance of relapses.

8. Oral administration of quinine sulphate for two consecutive days weekly, over prolonged

periods—the best of the *interrupted* methods of treatment, *i.e.*, 45 grains (3 doses of 15 grains) on two consecutive days weekly for eight weeks.

9. Comparison of results of interrupted and continuous quinine administration.

"In the Grains 30 series (*interrupted* treatment) the results after treatment were not observed, but it is noteworthy that the number of relapses after *continuous* treatment with grains 30 daily for two months lies between 79.1 and 90.7 per cent.

In the Grains 45 series the *interrupted* treatment gives a smaller percentage of relapses than the *continuous* treatment, possibly because in the *continuous* set many of the cases could not (owing to intolerance) complete the full course of eight weeks' treatment, or possibly the difference may be of no significance owing to the small number of cases observed.

However, we can with reason compare the results obtained by the *interrupted* Grains 45 series with those obtained by the *continuous* Grains 30 series. The patients of the former group received grains 90 of quinine weekly, whereas those of the latter group had grains 210 weekly. In spite of the fact that the Grains 30 series (*continuous* treatment) received two and a third times as much quinine weekly as the Grains 45 series (*interrupted* treatment), the results given by the latter treatment are strikingly better, only 28.6 to 38.1 per cent. relapsing as against 79.1 to 90.7 per cent. in the case of the Grains 30 series (*continuous* treatment). This superiority is as striking when the two treatments are compared from the palliative point of view, as previously shown.

Finally, we may compare the two modes of treatments from two other points of view:—

## TOLERANCE.

A daily dose of grains 45 is not well borne by all patients, and in fact in twelve of nineteen cases the treatment had to be abandoned on account of vomiting and tremors before completion of the eight weeks, but in no case did the administration of grains 45 twice weekly produce any intolerance, all the cases who remained in hospital completing the eight weeks' treatment without difficulty.

## ECONOMY OF QUININE.

The *interrupted* treatment requires over any given period only two-sevenths of the quantity of quinine required for the corresponding *continuous* treatment.

## CONCLUSIONS.

*Interrupted* treatment with quinine grains 30 or 45 twice weekly is preferable to *continuous* treatment with quinine grains 30 or 45 seven times weekly. Grains 45 twice weekly is better than grains 30 twice weekly or than grains 30 daily, both as a palliative and as a curative treatment."

10. Oral administration of quinine sulphate—120 grains on two consecutive days: "the maximum amount which can be tolerated by the

average case." Severe symptoms occurred in one-third of the cases—not satisfactory as relapses occurred in 60 per cent. of cases.

11. Oral administration of quinine sulphate—grains 90 on two consecutive days weekly, for three weeks.

"Quinine sulphate grains 90 on two consecutive days weekly over a period of three weeks' cures\* 50 to 54 per cent. of cases. These figures are therefore not quite so good as those obtained in the series treated with grains 90 on two consecutive days only, but the slight difference in the result may well be due to the smaller number of cases treated."

12. At what time after cessation of quinine treatment do relapses occur in simple tertian malaria?

"The general conclusion to be drawn from these observations appears to be that if a case of simple tertian malaria has not relapsed parasitically within four weeks of cessation of treatment he can be discharged from hospital with a risk of relapse of only about 13 per cent., whilst if he has not relapsed within six weeks of cessation of treatment his risk of subsequent relapse is reduced to less than 5 per cent."

It will be seen that in these valuable experiments the point arrived at was not merely the cessation of the acute symptoms (which is all the average patient thinks of) but the prevention of relapses, and it is by this high standard of the prevention of relapses, *i.e.*, *cure*, that this series and the experiments under Sir Ronald Ross are to be judged.

#### E. C. HARE AND QUININE.

In a recent issue (July) we recorded the history of the introduction of cinchona plantations into India. Here we recall something of the life of the I.M.S. man who practically introduced the proper treatment of malaria by quinine, *viz.*, Edward Hare, C.S.I., late Inspector-General of Hospitals, Bengal.

Some of our readers will be aware that in 1900 his son (Lt.-Col. E. C. Hare, I.M.S., retired, late Sanitary Commissioner of Eastern Bengal and Assam and in Behar and Orissa) published an unpretentious but interesting little book on the life of his father.

Edward Hare was born in 1812, in Norfolk, was educated at Cambridge and at the Winchester and Middlesex Hospitals. In 1839 he received a

commission as an Assistant-Surgeon in the Bengal Medical Establishment, and after a six months' uneventful journey he landed in Calcutta in July 1839, or nearly eighty years ago, just in time to be sent to join the army in Afghanistan, of which campaign his letters give very interesting glimpses; he saw Dr. Brydon, the "Remnant of an Army" brought into Jellalabad, and went through the siege of the cantonment at Kabul in 1841.

Chapter III of the little book gives an account of the work of Hare on quinine and malaria. When E. C. Hare arrived in India in 1839, the fashionable method of treating cases of fever was by bleeding and large doses of calomel; "bark" or quinine if given at all was used as a 'tonic' and *after* the fever had subsided. In those days it was said that mercury broke more constitutions than the climate; enormous doses were given and fortunately were not absorbed. Dr. Halliday recorded that 13,237 grains of calomel were used in one month in the Calcutta General Hospital. Nor were the usual results of bleeding much better.

After the Kabul campaign Hare found himself in the now long-deserted cantonment of Segowlie, in the north of Champaran District and not far from the *terai*. He obtained by chance the old medical treatises of Lind and Hunter, who even in the 18th century had recognised the value of cinchona in the early febrile stages. This revolutionised Hare's practice. He graphically tells the story of how he found a soldier deserted, worn out with fever and lying insensible in a native village. He gave him 20 grains of quinine and repeated it till the patient had taken 150 grains in 24 hours; after which he became well and returned to his regiment. Soon he had plenty of cases, and in November 1847, Hare published a pamphlet entitled modestly *Hints on Fever and Dysentery*, which caused a profound sensation "through the length and breadth of the Company's Indian possessions," and the sensation became so great that the Medical Board recommended Lord Dalhousie to let Hare have the opportunities of using the drug in his own way on a large scale in Calcutta. He explained his methods to the great pro-consul and he was given a year for the experiment and a ward in the General Hospital was put in his charge, and the experiment began on 1st November, 1849. In addition to his new duties, Hare

\* By 'cure' is meant "no relapse during an observation period of 60 days after cessation of treatment."

was also appointed Assistant Surgeon to H. M.'s 70th Regiment, and a sort of control experiment between Hare's cases and those of the Regimental Surgeon was started.

At the end of the year, however, Hare could show 292 cases with only 2 deaths ('68 per cent.) against the other Surgeon's 279 cases and 4 deaths, or 1 death in every 69 cases against Hare's record of 1 death in every 146 cases. In the General Hospital ward Hare's results were comparatively much better, a death-rate of '77 per cent. against a twenty-year hospital rate of 8'9 per cent., or no less than 1 death in almost every 11 cases! In time Hare was able to show a case death-rate of under half per cent. ('47).

As to his method, at once on admission the patient received one scruple of quinine (20 grs.), ordinary cases got this three times a day, "but if the fever was dangerous" he gave 30 grains at once and a scruple every 3 or 4 hours, and it

was "rarely necessary to continue this treatment beyond the second day after admission."

In 1851 the Medical Board reported most favourably on Hare's methods which, as Dr. Ewart, writing in *Indian Annals*, said, "gave the final deathblow to the spoliative treatment."

This led Lord Dalhousie to impress upon the India Office the necessity of introducing the cinchona trees into India—a subject we have told the history of in a recent issue (July 1918).

Hare retired from the service as Honorary Inspector-General of Hospitals in 1867 and in that year was gazetted to be a C. S. I.

## Current Topics.

### QUININE SUPPLIES IN INDIA.

THE following tables\* show the actual supplies of quinine in India and the exports and imports of the cinchona drugs in the last three years:—

TABLE I.

(1) *Statement Showing the Exports, from Bombay, of Quinine by Government and Chartered Vessels during 1916-17. and 1917-18, Exported to Mesopotamia by Government and Chartered Vessels.*

| 1916-17.                         |                |          | 1917-18.                   |              |          |
|----------------------------------|----------------|----------|----------------------------|--------------|----------|
|                                  |                | Rs.      |                            |              | Rs.      |
| Quinine Sulphas ...              | 1,808lb.       | 40,508   | Quinine Sulphas ...        | 6,116lb.     | 79,508   |
| Quinine Sulphas (Tablets) ...    | 1,119,420 doz. | 2,52,170 | Quinine Hydrochl. ...      | 50 "         | 650      |
| Quinine Acid Hydrochl. (Tablets) | 117,884 "      | 32,410   | Quinine Acid Hydrochl. ... | 139 "        | 2,240    |
|                                  |                |          | Quinine Sulphas (Tablets)  | 967,083 doz. | 1,27,655 |

TABLE II.

(2) *Statement Showing the Exports, from Bombay, of Quinine Salts by Chartered and Government Vessels on Government Account to Foreign Countries during the Calendar Year 1917.*

| Name of Ports.       | Quinine Sulph. | Quinine Hydrochl. | Tablets Quinine Sulph. (gr. 5). | Tablets Quinine Sulph. (gr. 2). | Tablets Quinine Acid Hydrobromide (gr. 30). | Tablets Quinine Acid Sulph. (gr. 5). |
|----------------------|----------------|-------------------|---------------------------------|---------------------------------|---|--------------------------------------|
|                      | lb.            | lb.               | No.                             | No.                             | No.   | No.                                  |
| Hospital Ships ...   | 137            | .....             | 113,858                         | 3,500                           | .....                                       | 33,000                               |
| Aden ...             | 55             | .....             | 2,500                           | .....                           | .....                                       | 44,126                               |
| Jask ...             | 13             | .....             | 500                             | .....                           | .....                                       | .....                                |
| Bunder Abbas ...     | 20             | .....             | .....                           | .....                           | .....                                       | 10,000                               |
| Muscat ...           | 500            | .....             | .....                           | .....                           | .....                                       | .....                                |
| Charbar ...          | 4              | .....             | 100                             | 200                             | .....                                       | 1,000                                |
| Shiraz ...           | 50             | .....             | 20,000                          | .....                           | .....                                       | 24,000                               |
| Kermann ...          | 50             | 10                | 600                             | .....                           | .....                                       | .....                                |
| Dar-es-Salam ...     | 500            | 200               | 1,681,700                       | .....                           | .....                                       | .....                                |
| R. I. M. Ships       | .....          | .....             | 3,120                           | 600                             | .....                                       | .....                                |
| Basra ...            | .....          | .....             | .....                           | .....                           | 3,800                                       | 100,000                              |
| Bushire ...          | .....          | .....             | .....                           | .....                           | .....                                       | 500                                  |
| Shaik Othman ...     | .....          | .....             | .....                           | .....                           | 8,701                                       | 4,380                                |
| London ...           | .....          | .....             | .....                           | .....                           | .....                                       | .....                                |
| (Quantity) Total ... | 1,329          | 210               | 1,822,378                       | 4,300                           | 12,501                                      | 217,006                              |
| Value in Rupees ...  | 35,883         | 770               | 36,448                          | 35                              | 2,833                                       | 5,244                                |

\* Supplied, on request, by the Director of Statistics, Mr. O. Findlay Shirras.

TABLE II—(contd.)

|                     | Quinine Sulph. | Quinine Hydrochl. | Quinine Acid Hydrochl. | Quinine Sulph. Tablets (gr. 5). | Quinine Acid Hydrochl. Tablets (gr. 5). | Quinine Acid Hydrochl. (Hypodermic) (gr. 5). | Quinine Hydrochl. (Ampoules.) |
|---------------------|----------------|-------------------|------------------------|---------------------------------|---|--|-------------------------------|
|                     | lb.            | lb.               | lb.                    | No.                             | No.                                     | No.  | .....                         |
| To Basra ... ..     | 6,645          | 50                | 45                     | 13,369,000                      | 165,000                                 | 3,670  | 4,000                         |
| Value in Rupees ... | 86,391         | 650               | 728                    | 36,000*<br>1,47,059             | 1,567                                   | 85   | 750                           |
| To Salonica ... ..  | 30,000         | .....             | .....                  | .....                           | .....                                   | .....  | .....                         |
| Value in Rupees ... | 855,000        | .....             | .....                  | .....                           | .....                                   | .....  | .....                         |

\* Supplied to H. T. Caronia for the use of troops during voyage and not included in the above figures.

TABLE III.

(3) Statement Showing the Quantity of Quinine, Imported into British India, by Sea from Foreign Countries during 1917-18 as compared with the Previous Year (1916-17), and the Pre-war Period.

|                               |     |     |     | Average of 5 years ending |        |          |         |          |         |
|-------------------------------|-----|-----|-----|---------------------------|--------|----------|---------|----------|---------|
|                               |     |     |     | 1913-14.                  |        | 1916-17. |         | 1917-18. |         |
|                               |     |     |     | lb.                       | £      | lb.      | £       | lb.      | £       |
| <i>Private Account—</i>       |     |     |     |                           |        |          |         |          |         |
| From United Kingdom           | ... | ... | ... | 89,524                    | 58,712 | 32,733   | 73,224  | 24,256   | 39,427  |
| " Ceylon                      | ... | ... | ... | 5                         | 3      | 13       | 16      | .....    | .....   |
| " Straits Settlements         | ... | ... | ... | 1,308                     | 860    | 1,056    | 2,380   | 1        | 3       |
| " Germany                     | ... | ... | ... | 17,498                    | 9,518  | .....    | .....   | .....    | .....   |
| " Holland                     | ... | ... | ... | 65                        | 52     | .....    | .....   | 125      | 119     |
| " Belgium                     | ... | ... | ... | 2,552                     | 1,597  | .....    | .....   | .....    | .....   |
| " France                      | ... | ... | ... | 816                       | 632    | .....    | .....   | .....    | .....   |
| " Italy                       | ... | ... | ... | .....                     | .....  | 31       | 261     | .....    | .....   |
| " Austria-Hungary             | ... | ... | ... | 120                       | 61     | .....    | .....   | .....    | .....   |
| " Java                        | ... | ... | ... | 1,854                     | 953    | 12,001   | 26,654  | 31,313   | 56,795  |
| " Japan                       | ... | ... | ... | .....                     | .....  | 100      | 288     | .....    | .....   |
| " China                       | ... | ... | ... | 60                        | 24     | .....    | .....   | .....    | .....   |
| " United States               | ... | ... | ... | 5,181                     | 4,877  | 1,856    | 4,194   | 9,710    | 9,310   |
| " Other Countries             | ... | ... | ... | 116                       | 82     | .....    | .....   | 2        | 6       |
| TOTAL                         | ... | ... | ... | 119,099                   | 77,371 | 47,790   | 107,017 | 65,407   | 105,660 |
| <i>On Government Account—</i> |     |     |     |                           |        |          |         |          |         |
| United Kingdom                | ... | ... | ... | 12,863                    | 7,042  | 1,497    | 2,853   | 1,704    | 3,380   |

(4) Balance of Quinine on 31st March, 1916 and 1917, in the Government Factories, Bengal and Madras.

|        |     |     |     | Quinine Sulphate. |         | Quinine Hydrochloride. |       | Quinine Sulphate Tablet. |       |
|--------|-----|-----|-----|-------------------|---------|------------------------|-------|--------------------------|-------|
|        |     |     |     | 1916.             | 1917.   | 1916.                  | 1917. | 1916.                    | 1917. |
|        |     |     |     | lb.               | lb.     | lb.                    | lb.   | lb.                      | lb.   |
| Bengal | ... | ... | ... | 165,244           | 131,976 | .....                  | ..... | .....                    | ..... |
| Madras | ... | ... | ... | 21,378            | 21,794  | 393                    | 743   | .....                    | 2,356 |

#### BLACKWATER FEVER.

In the *Journal R. A. M. C.* (April, p. 578) Major J. A. Arkwright and Dr. Elizabeth Lepper report on 16 cases of blackwater fever in men invalided to Malta from malarious Macedonia.

Their conclusions as to the etiology of the symptom or complication are as follows:—

#### CONCLUSIONS.

- (1) Blackwater fever is due to malaria.
- (2) It is predisposed to by a long-standing malarial infection with repeated relapses.

(3) An attack of blackwater fever is precipitated by a relapse or recurrence of malaria.

(4) The ascertained *maximum* and *minimum* intervals in different cases in our series between the arrival in a malarial country and the first attack of blackwater fever were *maximum* ten years, *minimum* seven months; between the first recognized attack of malaria and the first attack of blackwater fever, were *maximum* ten years, *minimum* fifty days; between the arrival in a country which was non-malarial and free from *anopheles* and the first attack of blackwater fever, were *maximum* five months, *minimum* one month.

(5) Quinine in the class of cases with which we have met has no share in producing blackwater fever, nor has



quinine treatment during or after the attack any effect in prolonging or reproducing hæmoglobinuria.

(6) The jaundice of blackwater fever is certainly in some cases due to bile-pigment in the circulation.

(7) It is possible to estimate the total amount of blood-pigment in the urine, whether in solution or in the deposit, after converting it into acid hæmatin (modified Sahli's method). The amount of hæmoglobin lost by the kidneys is much greater than would be ascertained by an attempt at direct hæmoglobin estimation of the urine. We are convinced, however, that the kidneys excrete only part, possibly a small part, of the hæmoglobin which is lost in an attack of blackwater fever.

(8) The treatment which appeared to be of most value was intravenous or rectal administration of physiological salt solution (NaCl, 0.9 per cent.). Whether quinine is of value or not was difficult to decide, since all our cases had some quinine and the intensity of the attack was no doubt different in each case.

#### PAY OF SUB-ASSISTANT SURGEONS.

THE following extremely liberal terms are now offered:—

The pay and prospects of Civil Sub-Assistant Surgeons in Bengal were last revised in the year 1910, upon representations of grievances received from members of that Service, and the new scales of pay then sanctioned, commencing from Rs. 30 in the first five years of a Sub-Assistant Surgeon's service, and rising to Rs. 100 in the case of an officer of the first class, senior grade, were notified in this Government Resolution of the 17th May, 1910, cited in the preamble. Subsequently, however, Sub-Assistant Surgeons in military service, as well as in the civil medical service of neighbouring provinces, have been remunerated on a scale higher than that offered to Sub-Assistant Surgeons in this Presidency, with the result that discontent with their prospects has been engendered amongst corresponding officers in Bengal, while difficulties have been experienced in securing recruits. The question has therefore been again taken into consideration, and the sanction of the Government of India has been obtained to a further increase in the rates of pay, which will come into force with effect from the 1st June, 1918.

2. The existing rates of pay in the different grades are compared below with those to the introduction of which sanction is now given:—

| Grades.                                 | Existing rates of pay. | Revised rates of pay now sanctioned. |
|---|------------------------|--------------------------------------|
| Senior grade (1st class) ...            | Rs. 100                | Rs. 120                              |
| Senior " (2nd class) ...                | 80                     | 100                                  |
| Grade " I (over 15 years' service) ...  | 65                     | 80                                   |
| " II (from 11 to 15 years' service) ... | 55                     | 70                                   |
| " III (from 6 to 10 years' service) ... | 45                     | 60                                   |
| " IV (from 1 to 5 years' service) ...   | 30                     | 50                                   |

3. The changes now made in the rates of pay will not in any way alter the conditions of promotion from the lower to the higher grades, which will continue to be regulated under the existing orders on the subject, i.e., the promotion from grade IV to grade III and from grade III to grade II will continue to be regulated by the results of the departmental examinations held under the rules prescribed for the purpose. There is no examination for promotion from grade II to grade I and from grade I to the senior grade, but each Sub-Assistant Surgeon in grade II is required to pass a period of five years in that grade before promotion to grade I, while promotion from grade I to the senior and within

the latter grade is given by selection. The total number in the senior grade will also continue to be restricted to 12 per cent. of the provincial establishment, viz., 10 per cent. in the 2nd, and 2 per cent. in the 1st class of that grade.

4. Sub-Assistant Surgeons without English qualifications, who are still in the service, will remain unaffected by these orders, as decided in paragraph 4 of this Government Resolution of the 17th May, 1910.

5. The revision of the salaries of Sub-Assistant Surgeons now sanctioned will necessitate an enhancement of the amounts payable by local bodies for the services of the officers of this class who are lent to them. Such contributions are at present made at the rate of Rs. 52 a month, but in cases in which the services of Sub-Assistant Surgeons were lent before the 1st August, 1913, contributions are recovered at the rate of Rs. 57 a month. With effect from the 1st June, 1918, the amounts payable by these local bodies will be raised to Rs. 69-8 and Rs. 76 a month, respectively.

6. The Surgeon-General with the Government of Bengal will be instructed to forward to the Accountant-General, Bengal, a list showing the names of the officers in the various grades drawing their salaries at the increased rates now sanctioned.

DR. IDA SCUDDER sends us a circular concerning the medical school for women established under the name of Mary Taber Schell Hospital at Vellore.

It was opened in July 1918, under the auspices of the Union Missionary Medical Committee. At first the teaching is to be for apothecary and sub-assistant surgeon only. It is open to all irrespective of class or creed.

The prospectus says nothing about the possibility of the pupils becoming able to be registered as medical practitioners.

DR. M. KAMEL BARRADAH, of the Kasr-el-Aini Hospital, Cairo, sends us a pamphlet on the value of permanganate of potash in the treatment of syphilis and soft sores. He suggests that the value of salvarsan is in its oxidization powers, so he decided to give permanganate a trial. He dissolves the drug in distilled water (0.05 of drug in 1 c.m. of water) and injects it into the veins; apart from local effects he claims there is no bad after-effects,—but he admits "it is painful during its administration." He gives many cases in support of his views.

#### Reviews.

**Ghosh and Deare's Materia Medica.**—Edited by Col. B. H. DEARE, I.M.S., and Dr. B. N. GHOSH. 7th Edition. Calcutta: Hilton & Co. Price Rs. 5-10.

ANOTHER, the seventh, edition of this most useful work is before us. It has proved a very successful book, and has been used by countless students since its first publication in 1901.

There are not many changes in the new or seventh edition; like the sixth it is adapted to the latest edition of the British Pharmacopœia. The new one has, however, been fully revised and corrected.

The new edition may therefore be confidently recommended to students and practitioners, and will doubtless meet with the same success as that accorded to the previous six issues.

**Tumours of the Nervous Acusticus and the Syndrome of the Cerebello-pontile Angle.**—

By HARVEY CUSHING, M.D., Professor of Surgery at Harvard University. 8vo, pp. 296 with 262 Illustrations. Philadelphia and London: W. B. Saunders Company. 1917. Price 21s. net.

THIS brilliant and sumptuously produced monograph deals with 29 histologically-certified cases of tumours of the cerebello-pontile angle, involving the VIII (acoustic) nerve. It illustrates the extreme specialisation that has taken place in cerebral surgery of recent years, largely the work of the late Sir Victor Horsley at the National Hospital for Paralysed and Epileptic in London. Dr. Harvey Cushing has done much original work since 1903 on this subject, and in this book gives a very interesting and scientific account of acoustic neuromata and their diagnosis and treatment. Sir Charles Bell gave the first clinical account of these cases in 1830; but the most remarkable and accurate account was given by Crüveilhier in 1835. It is reproduced together with Chazal's beautiful plate. Crüveilhier noted the blindness and loss of smell and hearing on one side, the fluctuating and contra-lateral cerebral nerve symptoms, pressure phenomena, absorption of the sella, cerebral herniations, etc. The first surgeon to remove one of these tumours successfully was Annandale, of Edinburgh, in 1895. Dr. Harvey Cushing's own 29 operations on this particular growth are divided into the first eleven operated upon at Baltimore, with a mortality of 35·4 per cent., and the subsequent 18 at Boston, in which it was lowered to 11·1 per cent.; whereas all previously recorded series gave a mortality of anything from 68 to 91 per cent.! There is little doubt that this wonderful reduction is due to growing experience, earlier diagnosis, and the more perfect operative technique developed by Dr. Cushing, of which he gives a very full account in the present work. It is impossible to go into the details of all this in a notice such as this, and we can only express our unstinted admiration at such a fine piece of work, and advise all operating surgeons to study it thoroughly. It should be mentioned that next to the reduced mortality as an important result of earlier diagnosis and more scientifically conducted operation is the saving of sight. Dr. Cushing goes so far as to say that it is somewhat disgraceful to permit a patient to go blind, or even to have the vision impaired, when the

choked disc in such cases—a mechanical process due to increased tension—can be surgically relieved.

It is fortunate for the American army that Professor Harvey Cushing's invaluable services are now at its disposal as Director of the United States Army Base Hospital No. 5.

**Eye, Ear, Nose and Throat—A Manual for Students and Practitioners.** By HOWARD CHARLES BALLENGER, M.D., Professor of Otolaryngology in the Chicago Eye, Ear, Nose and Throat College, &c., and A. G. Wipperrn, M.D., Attending Dentist and Aurist to St. Elizabeth's Hospital and formerly Professor of Ophthalmology and Otolaryngology, Chicago Eye, Ear, Nose and Throat College. Second Edition. Pp. 524. Illustrated with 180 Engravings and 8 Coloured Plates. Philadelphia and New York: Lea and Febiger, 1917.

THIS is a clinical manual describing the various methods of examining patients suffering from diseases of the eye, ear, nose and throat, and giving a brief account of the diseases in question and their treatment. It is obvious that to do this, besides giving the etiology, diagnosis, and prognosis in a small volume, the matter must be extremely condensed—and so it is. When it is said that in this edition an attempt has also been made to introduce the anatomy of the various parts, it will be understood that a great deal has been attempted, and that some parts of the four specialities concerned have to be treated rather cursorily. On the whole, however, the book may be recommended as containing a large amount of information clearly expressed and well illustrated; and as forming a useful introduction to larger text-books on the various specialities included. Dr. Wipperrn is responsible for the eye section, and Dr. Ballenger for the remainder of the book. The publishers have brought out the book very well.

**Medical Contributions to the Study of Evolution.**—By J. C. ADAMI, M.D., F.R.S. London: Duckworth & Co., 1918.

THIS book is an amplification of the Croonian Lectures delivered before the Royal College of Physicians, London, in June 1917, by Lieutenant-Colonel J. C. Adami, F.R.S., the well-known Pathologist of McGill College, Toronto.

At the time, Lieutenant-Colonel Adami was very busy with his military work in connection with the Canadian Forces in the Great War and naturally took as a subject one on which he had been for many years interested, *viz.*, "adaptation and disease," one of the basal problems of evolution. He had been long convinced that the latter-day investigations in medical science were of the highest significance to the general biologist and that the professional biologist had been "superbly indifferent" to their bearing on the problems of heredity, notwithstanding the fact that the

question of variation had always been the greatest concern of the evolutionist.

The cause or causes of variation are of the utmost importance, and controversy has mainly turned on the question whether "*variation is primarily inherent, proceeding from within, or primarily acquired, proceeding from without.*" "Now" (says Adami) "*if there be one fact that is constantly impressed upon the student of immunity and the worker in pathogenic bacteriology, it is that 'direct adaptation' (i.e., specific modification in response to a specific alteration in environment within limits) is one of the basal phenomena of living matter.*" This experience, he points out, is or was unknown to the academic (or professional) biologist.

Dr. Adami then goes on to give good grounds for his views, and the following sections will be read with great interest by medical men; and bacteriologists are mostly ready to admit that "pathogenic microbes at some period or periods have originated from the microbes saprophytic upon the body surfaces or existing commonly in the water and food-stuffs; that they have originated by adaptation of these forms to growth not merely on, but within, the tissues."

In Chapter IV, Dr. Adami summarises his conclusions as follows:—

1. "The evidence is abundant and conclusive that bacteria are capable of being modified by alterations of environment of certain orders, chemical and physical."

2. "The modifications in question that have been brought forward conform with Herbert Spencer's 'direct equilibrations'; a particular alteration of environment of certain orders leading inevitably to a particular modification whether of function or of form."

3. "By employing appropriate methods it can be shown that not some but all the microbes subjected to particular orders of alteration of environment exhibit the particular modification: the hypothesis of 'chance variation' in a particular direction, with the survival of the fittest, is incapable of explaining the phenomena."

We have not space to follow Dr. Adami in his elaborate exposition of these conclusions. We commend our readers to the book itself. It is one which all medical men can read with pleasure and profit.

**White and Martin's Genito-Urinary Surgery and Venereal Diseases.**—By EDWARD MARTIN, A.M., M.D.; BENJAMIN A. THOMAS, A.M., M.D.; and STIRLING W. MOORHEAD, M.D. Tenth Edition. Pp. 929. Illustrated with 422 Engravings and 21 Coloured Plates. Philadelphia and London: J. B. Lippincott Company. Price 30s. net.

A book which has reached its tenth edition requires, as a rule, little comment, and this volume is no exception. A considerable interval has elapsed since the publication of the last edition,

and this has been utilised for re-writing and re-illustration. The result is that the book is quite up to date and can be thoroughly recommended to the student as an excellent text-book.

The chapters are so arranged that the surgery of any particular organ is separately dealt with, cross references being used when necessary. The writing is clear and concise, and the illustrations are to the point, and are also extremely good. It is not possible to draw attention to the excellence of any one section as the book is a particularly level one; perhaps that on syphilis is the best. The printing, etc., are up to the publishers' high standard.

**The Third Great Plague.**—By J. H. STOKES, M.D., of the Mayo Clinic, Rochester, U. S. A. London: W. B. Saunders Company, 1918.

THIS is "a discussion of syphilis for every-day people." Against other plagues and diseases the resources of human knowledge have made good headway. For four centuries syphilis has raged largely unfettered, and though we have for long had 'cures' for the disease in mercury, and now in '606,' yet it has spread widely, mainly owing to the mistaken delicacy in discussing the subject.

Our author says, "Make a disease a household word and its power is gone." There may be some truth in this, but tuberculosis and malaria are household words and their power is not yet gone! This is the main object of this book,—to put the accepted facts of syphilis in a form so that they may become matters of common knowledge.

This, we must agree, the author has successfully accomplished, and the medical man may safely recommend this book to his patients, or to the public, who are at last becoming interested in our efforts to reduce the ill-effects of this veritable plague.

**Radiography and Radio-Therapeutics.**—By ROBERT KNOX, M.D. (Edin.), M.R.C.S. (Eng.), L.R.C.P. (Lond), etc. Part II. Radio-Therapeutics.

THE first edition of the work of which this book is Vol. II of the second edition, at once made its mark as a work of reference for the practical worker in a branch of therapeutics which is teeming with interest and suggestive of great possibilities. There is a good deal of new matter in this edition, and the original charm of the book—its simplicity and clearness—remains, while its value to the worker is largely increased by the added details, especially the references to the cases treated.

X-ray therapy and, perhaps even more, radium therapy, are branches of work which are not as much known as they will be in the not very distant future, and of their immense value in the future there is no doubt. Most welcome, therefore, is a second edition of a work which treats so clearly a subject of such extraordinary interest and

importance, for it is in radio-therapeutics that we have so far found help, where otherwise we were helpless, and by the aid of these methods unsatisfactory and otherwise intractable conditions are so often satisfactorily dealt with, where otherwise there was no hope of cure and scarcely any even of alleviation. We earnestly commend this book to the profession, not only in the interest of the subject itself it treats of, but in the interest of the many cases who are otherwise left with a gloomy future, but for whom a better knowledge of the possibilities of radio-therapy opens up definite possibilities of relief or even of cure.

**Handbook of Operative Surgery.**—By WILLIAM IRELAND DE C. WHEELER, B.A., M.D. (Dub. Univ.), F.R.C.S.I., Lt.-Col. R.A.M.C., Member of Council, Royal College of Surgeons, Ireland, &c. With an Introduction by Sir ALFRED KEOGH, G.C.B. Large Crown 8vo. Pages viii + 364. Plates and figures 226. Third Edition. London: Baillière, Tindal and Cox, 1918. Price 10s. 6d. net.

THE third edition of this useful little book on operative surgery is especially intended for the medical man, newly qualified, who at a time like this may be required to undertake grave surgical responsibility at a minute's notice.

There is much that is practical in the book, and many of the teachings bought by experience in this War are included. The sections dealing with local anæsthesia, ligature of arteries and transfusion of blood are among the best. The chapter on amputations is perhaps too stereotyped. The experience of this War has proved that a surgeon must be allowed much latitude in performing amputations, and a recital of the various procedures laid down by authority and custom has sometimes an embarrassing effect where the conditions are greatly altered.

The diagrams and figures are numerous and excellent, and the book is written in a thoroughly interesting and workmanlike manner.

**Sir William Ramsay.**—By T. C. CHAUDHURI, M.A. Calcutta: Butterworth & Co., 1918. Price Re. 1-8.

THIS sympathetic and useful short biographical sketch of Sir Wm. Ramsay, K.C.B., the distinguished chemist, is well worth reading. It sketches Ramsay's scientific career and points out the many and important discoveries made by him and gives a useful account of his great work on radio-activity. An appendix gives a long list of the great scientists and many writings. It is excellently printed.

**Maternity.**—By E. H. WYATT, Certified Midwife. Allahabad. Pioneer Press, 1918. Price Re 1-8.

THE sub-title of this useful little book very accurately expresses what it is—*viz.*, a simple book for mothers and for maternity nurses in India. It only runs to about 50 pages, but in

them is put a vast amount of useful and practical information.

The booklet is divided into nine chapters—care during pregnancy, preparation for birth, treatment during labour, treatment of mother and baby during lying-in, bottle feeding—good advice is given in those (very rare) cases where the mother is really unable to feed her own infant. The chapter on the premature baby is useful, and the simple *recipies* given in Chapter VIII are certainly of value. The little book is unpretentious, but distinctly practical, and can be safely recommended to numerous young wives and to nursing students.

**Diseases of the Skin: Their Pathology and Treatment.**—By MILTON B. HARTZELL, A.M., M.D. Pp. 753. Illustrated with 51 Coloured Plates and 242 Cuts. Philadelphia and London: J. B. Lippincott Company. Price 30s. net.

THE author has written this book for three classes of readers—*i.e.*, for the student as text-book, for the general practitioner as a practical guide, and as a book of reference to the dermatologist. As might be expected, with such varying types of readers, it is more suitable for one than another, and is more for the general practitioner than the other two classes mentioned above. From the point of view of the student; as a text-book, he would probably say that the volume was too comprehensive, and that it was impossible for him to find time to study it in conjunction with his other work, and this fault—if it is one—is the only point calling for adverse criticism. On the other hand, the dermatologist would find much information if he referred to the book, and the general practitioner should find it extremely useful.

The scheme of the book is shortly as follows: the first few chapters describe symptoms, pathology, diagnosis, etc., from the general point of view, and then the various diseases classified as congestions, inflammations from various causes, hæmorrhages, new growths, and so on.

Taking a specific disease, it is discussed under the headings of synonyms: this is distinctly useful as the nomenclature of skin diseases is somewhat confused; definition, symptoms, etiology, and so on. All these points are fully described, and special attention is given to pathology and treatment; and in the latter case careful details are given with numerous prescriptions, which make the book quite practical.

The eruptions of the specific fevers are also included: this is somewhat unusual, but it has distinct advantages when using the book for reference purposes.

The illustrations are numerous and of great excellence, whether coloured or not, and they include a large number of microscopic sections.

The work shows that the author has a large practical experience of his subject and also with the writings of other authorities. It is also thoroughly up to date, and can be confidently recommended to anyone desiring a comprehensive treatise on skin diseases.

## SPECIAL ARTICLE.

### GENERAL HOSPITAL, MADRAS.

As usual, the report of this great hospital contains much of interest, and we make the following extracts:—

**Accommodation.**—The accommodation remained the same during the year and the number of cots, *viz.*, 55, which were lent to the Military Department on the 7th October, 1916, were received back on the 4th December, 1917, so that the number of beds, *viz.*, 500, which the hospital is provided for, was complete at the end of the year.

On the abolition of the Government Voluntary Venereal Hospital (G.O. No. 391, dated 10th September, 1917), accommodation had to be provided for cases transferred from that hospital; accordingly twelve chronic venereal patients were received. This necessitated a change in accommodating patients, and for this purpose two rooms, C and D of the sheds, were vacated and made into venereal wards for women. Again, to prevent mixing of men and women, two other rooms A and B were also vacated, and all the chronic female patients who occupied the isolation huts were transferred to them. The remaining two rooms E and F were set apart for infectious cases occurring in the hospital.

The male patients who hitherto occupied these rooms (in the sheds) were removed to the isolation huts. This change has rendered matters satisfactory in that all female patients occupy one place and male patients another place separated from each other.

Separate accommodation was provided also to male venereal patients, surgical hut II having been reserved for them.

**Operations.**—The following is the comparative statement of work done by the three surgeons during the years 1915, 1916, and 1917:—

|                | Years. |       |       |
|----------------|--------|-------|-------|
|                | 1915.  | 1916. | 1917. |
| First Surgeon  | 1,394  | 1,311 | 1,294 |
| Second Surgeon | 960    | 978   | 1,018 |
| Third Surgeon  | 1,159  | 1,386 | 1,263 |
|                | 3,513  | 3,675 | 3,575 |

The above figures represent the number of patients on whom operations were performed. A comparison of the figures for 1917 with those of the two preceding years shows a decrease of 100 over 1916 and an increase of 62 over 1915.

Excluding such surgical aids as hypodermic injections, passing of catheters, etc., the number of operations performed during 1917 is as follows:—

|                |     |     |       |
|----------------|-----|-----|-------|
| First Surgeon  | ... | ... | 779   |
| Second Surgeon | ... | ... | 547   |
| Third Surgeon  | ... | ... | 25    |
| Total          | ... | ... | 2,051 |

**Kitchens (European and Indian).**—Careful supervision was exercised over this department, special attention being paid to the timely preparation and regular issue of diets.

Owing to the smallness of the pay of the cook attendants in the Indian kitchen, difficulty is often experienced in finding men to fill vacancies during illness or absence from any other cause of these servants. There are at present four attendants on a salary of Rs. 8 each per mensem, with one head cook on Rs. 15 and an assistant cook on Rs. 10. When any of these men absents himself for some reason, it is found very difficult or impossible to obtain the services of a caste man, immediately, to fill the place on the salary offered, so that the appointment remains vacant until his return, the duties of the absentee being divided among the remaining staff, thus throwing additional strain on them. The duties of these men differ widely from those of the European kitchen. They go about serving diets and extras round the hospital many times in the mornings and evenings, in addition to their other duties in the kitchen, while the duties of cooks in the European kitchen are more or less confined to the kitchen itself. A small increase in the salary of these men will improve matters to a great extent and the difficulty now experienced in finding caste men for employment will be overcome.

The report of the Wards of the First Physician is written by Major F. F. Elwes, C.I.E., I.M.S., and we extract the following notes of interest:—

**Kala-azar.**—Ten cases were treated with 2 per cent. tartar emetic solution injected intravenously; the maximum dose given in any case amounting to 12.5 c.c. One lady—a very advanced case—died suddenly during the course of the treatment. The cause of death was apparently embolism due probably to separation of a portion of blood clot from a vein which had been inflamed as a result of tartar emetic injection, though none of the fluid at any time escaped into the tissues around the vein.

Of the remaining nine cases two left hospital against advice after the temperature had become normal but before the spleen had become markedly reduced in size. One of these cases was readmitted to hospital two months after discharge with recurrence of symptoms, and in spite of further injections of tartar emetic the patient became worse, left hospital, and is, I understand, now extremely ill, probably dying. The other case continued to work till the end of the year 1917, but I am informed he still has an enlarged spleen and occasionally has fever. Of the remaining seven cases one is now in the army on active service in Mesopotamia and three more are alive and believed to be without any symptoms of kala-azar at present. The remaining three cases discharged from hospital, apparently cured, have not been heard of since their discharge.

**Asthma.**—A few cases of asthma were treated with peptone injections, but although the injection generally relieved the asthmatic symptoms at the time, it apparently had no power to prevent recurrence of the attacks as two patients who had been given the peptone treatment were readmitted to hospital subsequently with fresh asthmatic attacks.

**Pulmonary Tuberculosis.**—The intravenous injection of colloidal iodine was tried in two cases but without apparent result, either beneficial or otherwise; but in both cases the number of intravenous injections given was possibly too few in number.

**Lamblia intestinalis.**—This protozoon was found present in considerable numbers in the faeces of two patients, one a child and the other an adult, both suffering from dysentery. In both cases, however, amœbæ were also present and the dysentery yielded to the usual treatment for amœbic dysentery. The amœbæ were therefore probably the cause of the dysenteric symptoms, though no *Lamblia* could be found in the faeces after the subsidence of the dysenteric symptoms.

**Relapsing Fever.**—This disease does not occur in Madras, but a young Anglo-Indian man from Ajmere was admitted into hospital and the blood was found to



contain a large number of spirilla. An intravenous injection of 0.6 grams '914' was immediately administered; the temperature came down to normal within 48 hours and no relapse occurred during the subsequent fourteen days that the patient remained in hospital. Spirilla could not be found in the blood from the day following the salvarsan injection.

There were 25 cases of ankylostomiasis treated in the First Physician's Wards during the year 1917. Of these, 3 cases occurred in Europeans, the remainder in Indians. There was one fatal case, the patient dying of heart failure secondary to anæmia. Of the 25 cases, 16 were residents of Madras, the remaining 9 coming from different districts in the Presidency.

Dr. M. R. Guruswami has a short report on the work in the Wards of the Second Physician.

Interesting cases that were treated during the year are:—

(1) A case of pneumonia in a police constable, which was under treatment from the second day of illness and which showed *hematuria* on the eighth day. Temperature came down by crisis on the ninth day.

(2) A case of cerebral malaria in a police constable, who had three fits outside the hospital and two after admission. Blood showed B. T. and no malignant tertian parasites could be found in any of the slides taken. Temperature was not high, being only 101°. Quinine injection promptly controlled further fits.

(3) Two cases of aneurysm, one of left subclavian, which showed very little pressure symptoms; and another a huge aneurysm of the descending aorta, where the condition was made out in a routine examination of a patient who came in with a history of fever and weakness. Almost all the vessels in the trunk and upper extremities were tortuous and pulsating, while the femoral pulse could not be made out.

#### *A few therapeutic experiments.*

(1) A case of splenomedullary leukemia, which was treated with benzol and X-ray; slight improvement, beyond which the patient could not improve.

(2) Two cases of asthma, which were tried with cauterizing the septum nasi, with the idea of testing the theory of increased pulmonary blood pressure in asthma. The cases showed definite improvement and the treatment deserves further trial.

The report of the Third Physician is wholly statistical and does not admit of extracts.

Dr. M. C. Koman writes of the work in the Wards of the Fourth Physician, and we quote as follows:—

**Kala-azar.**—Twenty-seven cases of kala-azar were admitted into the wards. The diagnosis was made generally from the clinical feature of the cases and in several of them from the presence of Leishman-Donovan bodies in the peripheral circulation. Some of these patients were treated with intravenous injection of two per cent. tartar emetic in normal saline solution, beginning with a dose of 2 c.c. and gradually increasing to several injections of 10 c.c. Most of the patients so treated made rapid improvement,—fever dropping to normal after a few injections and reduction in the size of the enlarged spleen taking place gradually. Complete disappearance of the spleen was rare, though all the patients put on flesh and were restored almost to normal health.

**Filariasis.**—From favourable results observed by me in the treatment of filariasis by intravenous injection of novarsenobenzol, two cases with the history of frequent attacks of filarial lymphangitis were so treated in the wards with equally favourable results. A case of chyluria was also treated in the same manner (where *microfilaria* were found in the urine and blood); urine became clear within a week and although it continued

to remain so, a second injection was given as a precautionary measure two months later. Although six months have elapsed since the first injection was given the chyluria has not reappeared.

**Salvarsan in Brain Syphilis.**—A patient who was suffering from spastic paraplegia with defective vision and arterio-sclerosis was admitted into the wards after having received that morning an intravenous injection of .45 grams of arsenobenzol. He died soon after admission. Post-mortem examination revealed that the cause of death was softening of the brain on the left occipital lobe, which was probably brought on rapidly by the action of the drug on the affected area of the brain.

**Hysteria.**—Involvement of the higher centres:

1. A Hindu student, aged 17 years, of very neurotic temperament, was admitted on the 13th October, 1917, for pain in the large joints and convulsive fits. In the hospital it was noticed that he suffered daily once or twice from convulsive seizures in which the limbs were violently jerked about for 5 or 6 minutes, followed by a condition of catalepsy characterized by placidity of the limbs, calmness of the face, and deep respiration lasting from 4 to 6 hours. On waking up from the trance, he complained of some pain in all the large joints, especially in the shoulders and elbows and difficulty of speech and of swallowing. Salicylates, bromides, valerianates and persuasion having failed, chloroform was administered by inhalation until deep narcosis was produced. Thereafter the patient made an uninterrupted recovery and was discharged cured two weeks after admission.

2. A Sinhalese chauffeur, aged 25 years, of strong muscular development, was admitted on 1st September, 1917, for loss of speech, pain in the throat, and inability to protrude the tongue and to swallow solid food. The case was diagnosed as "hysterical aphonia." He was chloroformed and his tongue drawn out with a pair of forceps. On recovering from the effects of chloroform he was able to articulate a few words at a time. He was put again under deep chloroform narcosis on the fourth day. This had the effect of causing the complete disappearance of all the manifestations mentioned above, and the patient was discharged cured on 11th September, 1917.

As is usual, the note on the Surgical Work is of interest and is submitted by Lt.-Col. W. J. Niblock, I.M.S.

The following table shows the operative work done:—

| Class.        | Remained. | Performed during the year. | Total. | Cured. | Relieved. | Discharged otherwise. | Died. | Remaining. |
|---------------|-----------|----------------------------|--------|--------|-----------|-----------------------|-------|------------|
| Europeans ... | 7         | 303                        | 310    | 279    | 16        | 2                     | 2     | 11         |
| Non-Europeans | 31        | 882                        | 913    | 710    | 102       | 31                    | 23    | 37         |
| Total .       | 38        | 1,185                      | 1,223  | 989    | 118       | 33                    | 25    | 48         |

**Mortality.**—2.04 per cent.

Number of moribund cases admitted during the year: Europeans 2, non-Europeans 15, total 17.

Number of moribund cases discharged: European 1, non-Europeans 3, total 4.

Amongst the most interesting cases were the following:—

#### **Abdominal Operations.**—

(a) **Appendicitis.**—There were 36 operations for appendicitis, in 31 of which the appendix was removed, the other 5 were suppurative in which the appendix could not be found without increased risk to the patient. All the patients made good recoveries. One of the suppurating cases was interesting. The patient

was a Swiss doctor who had arrived in India five weeks prior to admission. He was to all appearances in good health when suddenly symptoms of acute appendicitis developed which rapidly went on to suppuration. Two stones were found in the abscess cavity, each of them the size of a large pea and faceted. On chemical examination they were found to consist almost entirely of calcium phosphate. No symptoms of appendix trouble were noticed by the patient previous to this attack.

(b) *Carcinoma of cæcum and colon*.—This had been diagnosed as a case of tubercular cæcum and even at the operation the appearance was similar to that disease. The cæcum, lower end of ileum, and the greater part of the ascending colon were involved, forming a large mass. No glands were involved. Complete resection with lateral anastomosis was performed.

On pathological examination, the growth proved to be an adeno-carcinoma.

The patient made a good recovery and when seen a year later was doing well. This is the first occasion on which I have met with an undoubted case of carcinoma of the bowels in an Indian situated between the stomach and the rectum, although I have seen many in both of the latter situations.

(c) *Tuberculosis of cæcum and ascending colon*.—Four operations, all for advanced conditions; two treated by complete excision and two by lateral anastomosis, all of whom did well.

(d) *Mesenteric cyst*.—This was met with in a man aged 55, and 136 ounces of brownish fluid with some caseating material were evacuated. The patient left hospital about four months later with a small sinus still persisting.

(e) *Carcinoma of undescended testis*.—This patient was admitted with a tumour the size of a man's head arising from an undescended testis and situated partly within the abdomen and partly between the muscular layers of the abdominal wall. It looked exactly like a hæmatocele and was removed with much difficulty. The patient died from shock two days later.

*Pathological report*.—Spheroidal-celled carcinoma. Had the real nature of the disease been known no operation would have been attempted.

(f) *Liver abscess*.—There were eleven operations for liver abscess, all by the open method, with one death. The case which ended fatally was an abscess in the left lobe containing 25 ounces of pus and of long duration, in an emaciated cooly, aged 50. He died eight days after operation from sheer exhaustion.

Eight of the abscesses occurred in the left lobe, and only in the case of one had emetine been made use of in the treatment of the preceding dysentery, and then not in sufficient amount to be of any use.

The other abdominal operations were for dilated stomach, gall stones, intestinal obstruction, etc., and have no special interest.

*Hernia*.—Sixty operations.

(a) *Inguinal*.—Reducible 46, irreducible 1, strangulated 12 (with 4 deaths).

(b) *Ventral* 1.

*Operations on Bladder (Cystotomy)*.—Included two for enlarged prostate and two for vesical calculus; all successful.

One of the latter cases was transferred from the medical wards where he was under treatment for advanced muscular dystrophy. The operation was performed with much misgiving, but was absolutely necessary owing to the intense agony which the stone gave rise to. The bladder was sutured and the wound healed by first intention, a result which, taking into consideration the condition of the patient, was as satisfactory as it was unexpected.

*Carcinomata*.—Several operations were performed for removal of carcinomata, chiefly of penis, breast, and tongue.

Unfortunately the great majority of the carcinomata seen at the hospital are already past the stage of operation. This remark applies specially to cancers

of the cheek and tongue, which, particularly the former, are intensely malignant.

On the contrary comparatively few cases of cancer of the penis are inoperable, even though the disease may extend almost to the pubis.

I have never yet seen a local recurrence after any case of cancer of the penis in which I have performed complete amputation, but have had recurrences after partial amputation, which operation I have now entirely given up. In cases of cancer of the cheek even after very free removal early recurrence is the rule.

One of the patients successfully operated upon this year for cancer of the tongue also suffered from tertiary syphilis and advanced diabetes, not to mention pyorrhœa, for which all his teeth had to be removed.

Cuprase was tried in two cases of inoperable carcinoma with most disappointing results.

*Cystic Tumour of Scrotum (Guinea-worm)*.—

A patient, aged 18, was admitted with a tense cystic swelling in the scrotum the size of a hen's egg, which was quite unconnected with the testis or wall of the scrotum. He could give no history as to its development or growth.

After removal the cyst was opened and found to contain five guinea-worms. There was no sign of guinea-worm elsewhere.

*Hydroceles hæmatoceles*.—One hundred and five operations, usually incision with eversion of the sac. There was one death.

*Elephantiasis scroti*.—Sixteen, all cured. The number of cases of this disease is steadily decreasing and those met with are much smaller than used formerly to be the case.

*This remark applies to most of the so-called "tropical" surgical diseases, which seem to be gradually disappearing.*

MAJOR J. J. ROBB, I.M.S., gives the following notes on the work of the Second Surgeon's and of the Venereal Wards:—

*Intussusception*.—A European male child, aged 6 months. This child was admitted with a diagnosis of intussusception. On palpating abdomen a distinct sausage-shaped tumour could be felt and the mother gave a history of the child passing some blood and slime. On my opening the abdomen intussusception was found in the ileum and reduced appendix was elongated and inflamed and removed. Child made a very good and uneventful recovery. I have not removed an appendix in so young a child before; the case is interesting in this respect.

*2. Gastro-enterostomy*.—A Hindu male, aged 30 years, gave a history of severe pain 2 or 3 hours after food, relieved by taking food and also disturbed at night by pain, also relieved by taking food. Good many adhesions were found on posterior wall of stomach and so there was difficulty in getting sufficient surface to do the anastomosis. The patient made an excellent recovery and complained of no pain whatever afterwards and he was discharged feeling quite well.

*3. Intestinal Obstruction*.—A Hindu male, aged 37 years, was admitted with a history of constipation, intense pain in the abdomen and persistent vomiting. Pulse 120, rapid, feeble. Temperature 98° F. It was diagnosed as intestinal obstruction. On opening the abdomen, the appendix was found much inflamed and thickened. The tip was adherent to the lower end of the ileum, forming a loop through which the bowel had become constricted and was very dark in colour but not gangrenous. The stricture was released and the appendix was removed. The patient recovered without any trouble.

*4. Strangulated Hernia*.—A Hindu male, aged 40 years, was admitted with symptoms of 'acute abdomen' and with a tense, tender, hard, irreducible swelling in the right inguinal region. The abdomen was acutely distended and on opening a portion of

transverse colon and a large piece of omentum was found in the sac. The omentum was cut off and there was great difficulty in returning the gut owing to the distention of the abdomen which could only be done by raising the patient's legs. The patient was discharged cured.

**5. Congenital Hernia.**—A Hindu male child, aged 5 years, was admitted with a soft reducible swelling about the size of an orange in the right inguinal region, with expansile impulse. The external ring admitted two fingers. The sac, on opening, was found to contain lower end of ileum, cecum, and appendix. The appendix was removed, the sac was separated, twisted, and sutured. The child made a good recovery.

**6. Carcinoma Breast.**—An Indian Christian female, aged about 60 years, was admitted with foul, ulcerated hard tumour, involving the whole of the right breast, with a thin sanious discharge from the ulcerated portion. The skin was adherent. The nipple was retracted. The glands were slightly involved. The general condition of the woman on admission was rather low for operation with a temperature of  $101^{\circ}$  F. in the evenings. After about a week's stay in the hospital, the temperature came to normal and she was operated upon. The insertion of pectoralis major was cut through and sternal and pectoral portions of the muscle were separated and pectoral portion completely removed. The glands in the axilla were completely taken away.

**7.** The two deaths shown against the 48 hydroceles were from a suppurating hydrocele and suppurating chylocele and these were not during my time.

The venereal wards were opened on 3rd November, 1917.

#### Admissions—

|                    | Europeans. | Non-Europeans. | Total. |
|--------------------|------------|----------------|--------|
|                    | 5          | 54             | 59     |
| <b>Discharges—</b> |            |                |        |
| Cured              | 2          | 6              | 8      |
| Relieved           | 3          | 22             | 25     |
| Otherwise          | ...        | 5              | 5      |
|                    |            |                | 38     |
| Remaining          | ...        | ...            | 21     |
|                    |            |                | 59     |

During the period under report, special treatment was carried out for gonorrhœa and infective granuloma.

**Gonorrhœa—In the Female.**—In the main the treatment adopted was that recommended by Watson. "After a prolonged sitz bath, containing about an ounce of kerol, the vagina is carefully and gently swabbed with 1 in 2,000 biniodide of mercury or 1 in 100 lactic acid. Care must be taken to remove all trace of the mercurial antiseptic, and the next procedure is, therefore, to swab well with plain sterile water and then dry with wool. Colossal argentum or protargol (1 to 2 per cent.) is then thoroughly applied to each infected area, the urethra, cervix and every reddened patch or pocket, receiving careful treatment with wool-wrapped probes dipped in the same solution, or by means of blunted hypodermic needles where probes cannot enter. The parts are again dried and the cervix when patent lightly packed with lactic bacillus powder, a bacillus pessary inserted high up in the vagina and the patient returned to bed.

"This routine is carried out night and morning for three or four days, when the condition will be found greatly to have improved. We then rely on lactic acid 1 in 100 as the only antiseptic for swabbing and the powder and pessaries as before. The silver preparation is continued for the urethra and all vulvar recesses harbouring gonococci, and the cervix and vagina, as a rule, only receive lactic acid swabbing and the powder and pessary."

This treatment was carried out in the period under report with some modifications. Speaking generally, there are indications that the treatment is very effective in simple cases of gonorrhœa where the disease has not spread to the uterus and tubes.

The lactic acid bacilli pessaries we were using were made at the Guindy Institute as follows:—

Lactose broth of 2 per cent. strength is inoculated with the lactic acid producing organisms, *B. Bulgaris* and *Streptothrix Dhahi* separately and incubated for three or four days at  $42^{\circ}$ C. The rich cultures thus obtained are mixed up with sugar of milk to a doughy consistency and cast into small pessaries in special moulds. They are then dried at  $42^{\circ}$ C in the incubator for two days.

*In the male.*—The local treatment of the urethra with injections of a 0.5 per cent. solution of protargol four times daily has yielded very satisfactory results.

**Infective Granuloma (*Granuloma Pudendi*).**—Two cases of this disease were treated in the wards in the period under report. Both of them were very advanced cases and the disease had existed for over a year. The routine treatment adopted was by means of intravenous injections of tartar emetic. The injections were first started with 2 c.c. of a 1 per cent. solution given on alternate days. The dose for each succeeding injection was gradually increased, the amount of increase depending on the reaction exhibited by the patient. This was continued till the dose of 5 c.c. of the 1 per cent. solution was reached. The injections were then continued, beginning with 3 c.c. of the 2 per cent. solution, the subsequent doses being gradually increased. As a rule, about 10 injections were required to obtain a cure; and by this time the ultimate dose reached was 5 c.c. of the 2 per cent. solution. The ulcers were dressed with gauze soaked in a 1 per cent. solution of tartar emetic.

There was one interesting point worthy of note, that if the injections were discontinued before complete cure took place, in a few days, fresh eruptions and ulcerations appear at the margins of the old. This is probably because as the curative dose for tartar emetic is very high the antimony has always to be kept circulating in the blood stream to effect a cure.

**Vaccines.**—*Gonococcus* vaccine was only used in one case of arthritis of the wrist. The result was very encouraging.

Dr. W. J. Fernandes gives the following notes from the Third Surgeon's Wards:—

Dr. Nedungadi was in charge of these wards from the beginning of the year till the 7th August, when I took charge.

**Operative Work.**—The following table shows the operations done during the year including hypodermic injections and catheterisation:—

| Class.         | Remained. | Operated. | Total. | Cured. | Relieved. | Discharged otherwise. | Died. | Remaining. |
|----------------|-----------|-----------|--------|--------|-----------|-----------------------|-------|------------|
| Non-Europeans. | 3         | 743       | 776    | 638    | 77        | 4                     | 30    | 27         |
| Europeans      | 3         | 132       | 135    | 123    | 6         | ...                   | 3     | 3          |
| Total          | 6         | 875       | 911    | 761    | 83        | 4                     | 33    | 30         |

**Mortality.**—3.28 per cent.

The following were the important or the interesting operations done during the year:—

**Tumours and Cysts.**—Twenty-two cases. Seventeen cured, three relieved, and two died.

**Wiring of Fractures.**—Two cases. One was a compound fracture of the lower jaw and the other a transverse fracture of the patella. The jaw case was

cured and the patella case is still in the hospital, the result being successful.

**Excision of Jaw (Upper and Lower).—**Three cases. All cured.

**Sequestrotomy—**(For necrosis).—Twenty-three cases. Nineteen cured and four relieved.

**Major Amputations.**—Sixteen cases. Eleven cured, two relieved, two died, and one remaining. One of these was a Hindu male, aged 18, with cavernous angioma of the arm. He was admitted on 6th January with a soft tumour on the inner aspect of the upper arm, fluctuating but free from pain. It was thought to be a chronic abscess and opened, when profuse hæmorrhage (venous) started. On dissection the whole arm was found to be covered with a network of very dilated and thin-walled veins. Some were so dilated that bleeding occurred on the slightest touch. This state of affairs existed as far as the middle of the axilla, and finding it impossible to stop the bleeding, the arm was amputated at the shoulder. Many of the dilated veins had lots of phleboliths in them. The dilated plexus of veins had only the thinnest endothelial lining. The patient recovered uninterruptedly.

**Elevation of Depressed Fracture of the Skull.**—Two cases. One cured and the other died. One of these cases was a Hindu male, aged 30. He was brought to the hospital on the night of the 7th October, 1917, with a history of having been given a blow with a stick on the head. When I saw him on admission there was a large hæmatoma on the left parietal region with a wound. The patient was semi-conscious but had no definite symptoms of compression. On probing the wound I suspected fracture of the skull. The patient was taken to the operation theatre and under general anæsthesia a semi-circular flap was reflected. It was then found that a portion of the left parietal bone, a little more than a rupee size, was fractured into four pieces which were jammed into the membranes and brain. The membranes were badly torn and the brain surface was lacerated, pieces of brain-matter escaping through the opening in the meninges. The fragments were elevated and removed one by one. The meninges and the brain surface were gently washed out with saline and the wound on the scalp was closed, leaving a gauze drain. The patient was fully unconscious for three days after operation. He then gradually recovered consciousness and made an uninterrupted recovery. He was discharged from the hospital at the end of November.

## Correspondence.

### SIR PARDEY LUKIS MEMORIAL FUND: FRESH LIST OF SUBSCRIBERS.

(Amount Already Announced, Rs. 2,502.)

Mr. J. F. Madan, Rs. 301; Sir R. N. Mookerjee, Rs. 250; Messrs. Smith, Stanistreet & Co., Rs. 250; Messrs B. K. Paul & Co., Rs. 250; Colonel H. E. Banatvala, I.M.S., Rs. 100; Sir B. C. Mitter, Rs. 50; Lt.-Col. W. A. Lane, I.M.S., Rs. 50; Dr. P. D. Bose, Rs. 50; Major J. W. McCoy, I.M.S., Rs. 32; Col. G. W. P. Dennings, I.M.S., Rs. 32; Lt.-Col. J. W. F. Rait, I.M.S., Rs. 32; Lt.-Col. C. R. Stevens, I.M.S., Rs. 32; Lt.-Col. E. A. R. Newman, I.M.S., Rs. 25; Dr. G. D. Mehara, Rs. 25; Dr. B. D. Mookerjee, Rs. 25; Dr. W. S. Ratuwalli, Ceylon, Rs. 15; Dr. Jatindranath Bose, Rs. 10; Dr. Taraknath Majumdar, Rs. 10; Rai Haridhan Dutt, Bahadur, Rs. 10; Major R. Brown, I.S.M.D., Rs. 10; Dr. S. C. Bhattacharji, Shillong, Rs. 10; Dr. Girija Sankar Kar, Rs. 5; Dr. Sudbir Kumar Sen, Rs. 5; Dr. Ashutosh Mukerji, Rs. 5; Dr. Bidyananda Dutt, Rs. 5; Dr. Dhruva Mohan Chatterjee, Rs. 5; Dr. Ramani Mohan Mukerji, Rs. 4; Dr. Priya Har Gupta, Rs. 2; Dr. Anil

Chandra Das, Rs. 2; Dr. S. K. Ganguli, Rs. 2; Dr. Siddheswar Majumdar, Rs. 2; Dr. K. N. Ghosh, Rs. 2.

Subscriptions to be sent to

LT.-COL. F. O'KINEALY, I.M.S.,  
General Hospital,  
CALCUTTA;

or to  
RAI CHUNILAL BOSE, BAHADUR,  
CHEMICAL EXAMINER,  
Medical College,  
CALCUTTA.

### TREATMENT OF BERI-BERI.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—I have the honour to inform you that the Medical Department of the Federated Malay States, and more especially the Institute for Medical Research at Kuala Lumpur, has, for some considerable time past, been engaged in experiments on the treatment of beri-beri with an extract of rice polishings.

2. Several varieties of extract have been prepared, both by Messrs. Burroughs, Wellcome and Company and in the Laboratory of the Institute at Kuala Lumpur, and in reporting the results of treatment the Acting Director wrote on the 17th April, 1917, as follows:—

“The preparation of Messrs. Burroughs, Wellcome and Company, Extract B, was issued to Government Medical Officers in June, 1916, together with a memorandum containing instructions as to its use. Several private practitioners in the Federated Malay States and Straits Settlements have asked for the remedy for trial, and these requests have been complied with as far as possible by issuing supplies prepared in this laboratory. It had been ascertained that the latter preparation was more ‘active,’ volume for volume, than the Burroughs-Wellcome product, and the dosage was adjusted accordingly. In these conditions no difference was observed in the efficiency of the two preparations.”

Reports have now been received from a number of Government Medical Officers and private practitioners, and I have myself been able to observe the effects of the remedy in a series of cases. After making due allowance for the enthusiasm of observers, usually noted in the reports of new lines of treatment, the results show that the remedy has proved to be of definite value in early and acute cases of beri-beri. In old and chronic cases with widespread destruction of nerve and muscle tissues, benefit has been slight or absent.

The theoretical consideration and experimental results upon which the remedy is based have thus been confirmed in practice in the treatment of human beri-beri.

3. The value of the remedy being now established, I have sanctioned a supplementary provision of Rs. 1,500/- for the current year to cover the cost of further supplies.”

I have, etc.,

ARTHUR YOUNG.

Attention is directed to the researches of Dr. Chick, of the Lister Institute on the subject of beri-beri and scurvy (Journal, R. A. M. C., August, 1917, copy attached):

It is shown that the germ (or embryo) of the grain removed during milling is the principal source of the anti-neuritic vitamine. This should not be excluded from the bran. Both should be used.

In the modern “roller” milling of wheat and rice there is a complete separation of bran and germ. Asiatics whose diet is polished rice contract beri-beri. Asiatics who use *atta* [here remain embryo and bran] do not fall victims to the disease. Prevention is better than cure.

12th October, 1917.

HAVELOCK CHARLES.

### CASE OF SYPHILITIC FEVER.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—In the June number of the *Indian Medical Gazette* I find a case of syphilitic fever reported by Lt.-Col. E. Hassel Wright, I.M.S.

In my experience, I remember a similar case treated by me a few years back. It was a young man, aged 35 years, suffering from irregular fever for a long time. He was treated by a few practitioners for malaria, etc., but without success. I knew he had suffered from syphilis a few years ago. The symptoms and type of fever suggested malaria or tuberculosis, but the diagnostic tests usually employed gave negative results for both the diseases. From his history of syphilis, and enlargement of supratrochlear glands, I naturally surmised spirochætal toxins to be the cause of the fever. He was treated with ordinary liq. hydrarg. perchlor. and pot. iodide. Improvement set in two or three days after beginning the treatment, and after two months he was absolutely cured. He is enjoying absolutely good health since the last four years.

Yours, etc.,

JADUNJI HUNSRAJ VAIDYA, I.M.S. (Bo.),  
Chief Medical Officer, Cutch State.



## CASE OF ITCHING.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—I trust the undernoted case will be of interest to the profession :—

A boy, aged eleven years, came to the outdoor public dispensary. His relatives who accompanied him showed signs of great anxiety over the suddenness and severity of an attack of itching over the whole body of the boy. The boy had got up perfectly well one morning, but after he returned from his morning call he suddenly became restless, with a bad feeling of itching of the whole body. No history of any animal or vegetable poisoning. Itching attacks recurred at short intervals with great severity, whilst during the intervals the boy was perfectly well. No apparent marks of any kind found on the body to explain the occurrence of the trouble. It was said that all those who rubbed his body during the attack felt a similar sensation up to the elbows for some time. I did not feel much impressed by the history and so waited to see an attack myself, which was really a very bad one.

I could not make out as to what should be done. I took it to be a form of an angio-neurosis, and so prescribed six doses of a mixture containing mag. sulph. one drachm, calcium chloride, ten grains, and pot. bromide, three grains, to be taken every hour.

After the first dose, and not afterwards, the attack recurred, but very, very much modified. After the fourth dose he had nothing of the like nature and did perfectly well.

I should like your readers to let me know if they, too, have met with such cases and as to what they think of them.

Yours, etc.,

K. N. WAGHRAY, M.B., B.S.,

Civil Assistant Surgeon.

Hardwar.

## Service Notes.

On June 11th, 1918, the *London Gazette* announced that following the example of the home service Surgeon-Generals in the I. M. S. were to be entitled and ranked as Major-Generals and as Lieut.-Generals according to their relative rank. This concession was withheld when *pucca* rank was given to officers below this grade and has now been wisely conceded. We have not heard if there is any alteration in the pay of these officers, but that too will follow the lines laid down for the home service. The I. M. S. now will have seven officers of general rank, three as Surgeon-General with the Governments of Madras, Bombay, and Bengal Presidencies, one who is Director-General of the Service and three military appointments as D. D. M. S.

THE casualties to officers reported during the fourteen days, 8th to 21st May, 1918, inclusive, again reached a very high total—4,909. No less than 1,125 were reported as prisoners, among whom are a large number who had previously been returned as missing. They were presumably lost when the fifth army was broken before St. Quentin. On and after 21st March these casualties are tabulated as follows :—

|           |     |     |       |
|-----------|-----|-----|-------|
| Killed    | ... | ... | 950   |
| Died      | ... | ... | 19    |
| Wounded   | ... | ... | 2,308 |
| Missing   | ... | ... | 507   |
| Prisoners | ... | ... | 1,125 |

Total ... 4,909

During the fortnight, again, nearly a hundred (89) casualties to medical officers were reported. The names are given below. All, unless otherwise stated, are temporary officers of the R. A. M. C.

*Killed or died of wounds.*—Majors R. G. Gordon, D.S.O. (R.G.A.), and J. B. Metcalfe (Australians); Captains J. F. Matheson, M.C. (P. G. Milne, H. G. Massy Miles, T. Whitelaw (T.F.)), J. K. Venables, M.C. (New Zealanders), R. MacGrath, and P. B. Sewell (Australians); and Lieutenant and Quartermaster A. H. Addey-Jibb.

*Died.*—Lieut.-Colonel A. G. Sargent (I. M. S.); Major J. S. Little (I.A.S.); Captain W. McQuiban; and Nurse E. MacM Warnock (V. A. D.).

*Wounded.*—Colonel J. W. H. Houghton, D.S.O. (R. A. M. C., regular); Lieut.-Colonels C. A. Stidston, D.S.O. (T. F.), W. R. Gardner, D.S.O. (T. F.), and J. la F. Lauder, D.S.O., M.C.; Majors L. S. H. Roche, W. MacM. Chesney, M.C. (S. R.), K. N. Steele (Australians), E. J. Bradley (S. R.), and E. E. Herga, M.C.; Captains H. E. Williamson, A. B. Simes (Canadians), D. W. Anderson, J. Stevenson (S. R.), G. F. Carr (T.F.), S. G. Gibson, M.C. (Australians), W. H. Hawthorne (Australians), M. H. Muller, M.C. (Australians), J. I. Lauson (S. R.), R. W. Pearson, J. E. G. Thomson, T. D. C. Watt, M.C., H. Wilson, H. M. Godfrey, J. MacG. H. Reid,

J. M. Smith (T. F.), C. K. Carroll, M.C. M. P. Powor, R. I. Forsyth (Australians), J. Colgan, C. Cairnie, E. Forbes, M.C., H. F. Brice-Smith, L. V. Gatt, E. G. Thomson (Australians), R. P. Wheeler, M.C. (Australians), E. D. F. Hayos, E. C. W. Starling, M.C. (S. R.), and A. Fordyce (T. F.); Captain and Quartermaster J. T. Starkie, M.C. (R. A. M. C., regular); Lieutenants J. B. Taylor, A. C. Reid, and J. A. Stewart; and Lieut. and Quartermaster H. G. Millor.

*Missing.*—Captains S. V. P. Pill, G. S. Moighan (T. F.), F. J. Naltrass (T. F.), A. B. Chickie, and F. C. Nichols, M.C. (T. F.); and Lieutenant D. Robertson.

*Prisoners of War.*—Major J. Kennody (S. R.); Surgeon W. A. McKerrow (R. N.); Captains H. P. Jones, J. P. Thierens, J. G. Elder, D. F. Dobson, F. P. Smith, L. S. H. Glanville, O. C. Hanson, M.C., F. R. Pickle, R. R. Duncan, C. E. Rodman, R. M. Soames, E. Underhill, W. Arnolt, W. H. McCarter, E. E. Mather, D. F. Torrens, C. Mearns (T. F.), S. A. Forbes, C. G. Gibson, H. C. Martin, and C. A. Meaden; Lieutenants G. B. Buckley, M.C., F. J. Power, M.C., and J. A. Loughbridge.

Captain Patrick George Milne, R.A.M.C., was reported as killed in action in the casualty list published on 10th May, 1918. He was educated at Aberdeen University, where he graduated as M.B. and Ch.B. in 1915, after which he took a temporary commission as Lieutenant in the R. A. M. C., and was promoted to Captain after a year's service.

Major John Wishart Little, I.M.S., died at Karachi, on 7th May, 1918, aged 41. He was born on 27th March, 1877, the youngest son of the late Robert Little, M.D., of Singapore, and was educated at St. Thomas' Hospital, taking the M.R.C.S. and L.R.C.P., London, in 1900, and graduating as M.B. London, with honours in forensic medicine, the same year. Entering the I. M. S. as Lieutenant on 27th June, 1901, he became Captain on 27th June, 1901, and Major on 27th December, 1912. He served on the North-West Frontier of India, in the Waziristan Campaign of 1901-02 (medal with clasp); and in East Africa, in Somaliland, in 1913-01 (medal with clasp). Before the war he was Agency Surgeon at Gilgit.

Captain J. F. Matheson, M.C., R.A.M.C., temporary, was reported as having died of wounds in the casualty list published on 9th May, 1918. He got the Military Cross on 1st January, 1918.

Major J. B. Metcalfe, Australian Army Medical Corps, was reported as having died of wounds in the casualty list published on 10th May, 1918.

Lieutenant and Quartermaster A. H. Addey-Jibb, R.A.M.C., was reported as having died of wounds in the casualty list published on 8th May, 1918.

Captain Thomas Whitelaw, R.A.M.C., was reported as killed in action in the casualty list published on 13th May, 1918. He was educated at Glasgow University, where he graduated as M.B. and Ch.B. in 1912, and took a commission as Lieutenant in the 1st Northern (Newcastle) General Hospital (T. F.), on 20th April, 1915, being promoted to Captain a year later. He was attached to the Duke of Wellington's regiment.

Captain William McQuiban, R.A.M.C., died on service in Egypt, on 2nd May, 1918. He was educated at Aberdeen University, where he graduated as M.B. and Ch.B. in 1901, and was in practice at Lordship Park, Stoke Newington, North London, also holding the appointment of Clinical Assistant Aural Surgeon at the London Hospital, till he took a temporary commission in the R. A. M. C. in 1916.

Captain Joseph Kendrick Venables, M.C., New Zealand Medical Corps, died of shell wounds in a casualty clearing station on 9th May, 1918. He was the son of the late Joseph Venables, of Christchurch, New Zealand, and qualified as L.R.C.S. Ed., L.R.C.P. Ed., and L.F.P.S.G., in 1914. After acting as House Surgeon of Christchurch Public Hospital, he joined the New Zealand Medical Corps. He received the Military Cross on 1st January, 1918.

Major Reginald Glegg Gordon, D.S.O., Royal Garrison Artillery, was killed in action on 26th March, 1918. He was born at Valparaiso on 26th September, 1878, the son of Mr. D. S. R. Gordon, and was educated at Edinburgh University, where he graduated as M.B. and Ch. B. in 1903, also taking the diploma in tropical diseases. After qualifying, he served as House Physician in the Edinburgh Royal Infirmary, as Extra Assistant Physician in the Edinburgh Royal Asylum, and as Second Assistant Medical Officer in the Crichton Institution, Dumfries, and also studied insanity in Italian Asylums; but some years ago he gave up medicine and took to farming at Kinaldie, Perthshire. He held a commission in the Lowland (City of Edinburgh) Territorial Battalion of R. G. A. in which he attained the rank of Major on 21st May, 1915, was mentioned in despatches in 1917, and received the D. S. O. in January, 1918.

Captain Roger MacGrath, R.A.M.C., was reported as having died of wounds in the casualty list published on 18th May, 1918. He graduated as M.B., B.Ch., and B.A.O.



in the National University of Ireland in 1914; joined the R. A. M. C. as a Temporary Lieutenant on 25th January, 1915, and was promoted to Captain on the completion of a year's service.

The late Brigade-Surgeon John Law, Madras Medical Service, who died at Guildford on 6th February, 1918, left property to the value of £49,913. After payment of various legacies to his housekeeper and to sundry charities to the amount of £8,000, the residue of over £40,000 was left to King Edward's Hospital Fund for London.

Lieutenant-Colonel Alfred George Sargent, Indian Medical Service, died of angina in Mesopotamia on 14th May, 1918. He was the eldest surviving son of the late Lieutenant Colonel G. F. Sargent, I.M.S., born on 14th September, 1872, and took the M.R.C.S. and L.R.C.P., London, in 1896. Entering the I.M.S. as Lieutenant on 28th January, 1898, he became Captain on 28th January, 1901, Major on 28th July, 1909, and Lieutenant-Colonel on 28th July, 1917. He served in the third China War of 1900, receiving the medal. Before the war he was Superintendent of Rangoon Lunatic Asylum, and Lecturer on Materia Medica in the Rangoon Medical School.

Captain P. B. Sewell, Australian Army Medical Corps, was reported as killed in action in the casualty list published on 20th May, 1918. He had been reported some time before as missing.

The number of casualties among officers reported during the fourteen days, 22nd May to 4th June, 1918, inclusive, was still high—2,266, though less than half of those of the three preceding fortnights. These casualties do not include any from the last German advance, which began on 27th May. They may be tabulated as follows:—

|               |     |     |     |       |
|---------------|-----|-----|-----|-------|
| Killed ...    | ... | ... | ... | 421   |
| Died ...      | ... | ... | ... | 15    |
| Wounded ...   | ... | ... | ... | 1,102 |
| Missing ...   | ... | ... | ... | 163   |
| Prisoners ... | ... | ... | ... | 565   |
| Total ...     | ... | ... | ... | 2,266 |

The number of casualties among medical officers reported, 57, was much less than in the three preceding fortnights. The names are given below. All, unless otherwise stated, are temporary officers of the R.A.M.C.

Those marked with an asterisk are all Canadians, killed or wounded, when German airmen attacked the hospitals at Etaples on 25th May.

*Killed or died of wounds.*—Major E. G. Elliott (regular, R.A.M.C.); Captains D. H. Hall and D. E. Howes; \* Surgeon A. L. Pearce Gould (R. N., temp.); Lieutenant W. E. Brown; and Sisters K. M. Macdonald\* and E. M. M. Wake.\*

*Died.*—Lieutenant-Colonel F. W. Thomson (Bengal, retired); Major A. Westlake (T.F.); Staff Surgeon C. R. M. Baker (R.N.); Captain L. H. Y. Stephen; and Dr. R. W. Spence (East Africa).

*Wounded.*—Lieutenant-Colonels D. Ahern, D.S.O. (regular, R.A.M.C.), W. H. Burney (regular, R.A.M.C.), and K. D. Murchison, D.S.O. (S. R.); Majors N. W. Kidston (T. F.), A. R. Clayton (Australians), C. R. Merrilees (Australians), E. B. Hogan, and H. E. Macdermot; \* Captains L. H. H. Boys, W. H. Morrison (T.F.), H. Meddelsohn (Australians), F. R. M. Heggs (T.F.), R. J. Aherne, A. Buchanan, H. E. Cresswell, M.C., E. M. Gordon-Glasscock (Australians), R. K. Rae (Australians), R. B. Anderson, \* C. B. Davies, \* W. F. McIsaac, \* H. C. Pearson, \* J. H. Walmsley, \* J. H. Duff\* (Canadian Dental Corps), J. H. Bensted, J. N. Cruickshank, M. Foulkes, and A. J. Weilan; Captain and Quarter-Master R. J. Fleming (R.A.M.C., regular); Lieutenants E. N. B. Maitland and T. W. Shaw; Surgeon-Probationer G. R. Falcon (R.N.V.R.); and Sisters M. C. Hirsch, \* G. D. Lang, \* M. Lowe, \* B. Mackinnon, \* and I. K. Wishart.\*

*Wounded or Missing.*—Captain P. V. McLachlan, M.C. *Prisoners of War.*—Surgeon H. C. Broadhurst (R. N., temp.); Captains J. R. H. Ross, M.C., J. B. Ball, W. J. Isbister, M.C., E. J. Darke, M.C., J. Sullivan, F. C. Nicholas (T.F.), and F. Dallimore, M.C.

Surgeon Alfred Henry Pearce Gould, R.N., attached to the Royal Marine Light Infantry, Royal Naval Division, was killed in action on Whitsunday, 19th May, 1918, aged 31. He was the youngest son of Lieutenant-Colonel Sir Alfred Pearce Gould, K.C.V.O., R.A.M.C. (T. F.), and was educated at Oxford, where he gained a classical scholarship at Christ Church College, and graduated as B.A., with first class honours in Natural Science in 1909, and as M.A., M.B., and B.Ch. in 1913; and at University College Hospital, where he took the Ericksen prize in Practical Surgery in 1913, and the Aitchison scholarship in 1914, taking the M.R.C.S. and L.R.C.P., London, in 1913, and the F.R.C.S. in 1916. After serving as House Surgeon at University College Hospital, he took a temporary commission in the Royal Navy at the beginning of the war.

Captain St. John Alexander Molesworth Tolhurst, New Zealand Medical Corps, was killed in action on 12th May, 1918. He was the youngest son of George Edmeades Tolhurst, of the Union Bank of Australia, Wellington, New Zealand, and was educated at the College in that city, and at Guy's Hospital, where he was Captain of the Rugby fifteen. He took the M.R.C.S. and L.R.C.P., London, in 1907, and the M.B. and B.S., London, in 1909, and after acting as Out-patient Officer, House Physician, and Assistant House Surgeon at Guy's, returned to New Zealand, and went into practice at Wellington, where he was Honorary Physician to the Hospital. He joined the New Zealand Forces early in the war, and served in the New Zealand Hospitalships *Mahena*, in Gallipoli, and *Marama*, and afterwards with the 3rd N. Z. Field Ambulance, and with the N. Z. Infantry. He was killed while working in an aid-post.

Captain D. E. Howes, Canadian Army Medical Corps, and Sisters K. M. Macdonald and E. M. M. Wake, of the Canadian Army Nursing Service, were killed; and eight Canadian Medical Officers and five Nursing Sisters were wounded, when the Canadian Hospitals at Etaples were attacked by German airmen on 25th May, 1918.

Captain David Henry Hall, R.A.M.C., attached Seaforth Highlanders, was reported as having died of wounds in the casualty list published on 24th May, 1918. He was educated at Trinity College, Dublin, where he graduated as M.B. and B.Ch. in 1915, after which he took a temporary commission in the R. A. M. C., and was promoted to Captain after a year's service.

Dr. Reginald Westmore Spence died of blood-poisoning, on service in East Africa, on 19th May, 1918, aged 31. He was the eldest son of Ernest Spence, of One Tree Corner, Guildford, and was educated at Westminster Hospital, taking the M. R. C. S. and L. R. C. P., London, in 1913.

Major James Beverley Metcalfe, Australian Army Medical Corps, who died of wounds on 24th May, 1918, was the son of the late Dr. Metcalfe, of Norfolk Island, Australia, and was born on 13th January, 1888. He was educated at Sydney University, where he graduated with distinction as M.B. and Ch.M. in 1911. After serving as Resident Medical Officer of the Royal Prince Alfred Hospital, Sydney, he went into practice at Wellington, New South Wales. He joined the Australian Forces, and went to France early in 1916; received the Military Cross in October, 1916, and was promoted to Major on 29th January, 1917. He served successively as Battalion Medical Officer in a field ambulance, and as D. A. D. M. S., and was wounded near Ypres in October, 1917; went to France again in March, 1918, and received his fatal wound at an advanced dressing station on the river Ancre on 24th April. He has been posthumously recommended for the D. S. O.

Captain Lionel Henry Yorke Stephen, R.A.M.C., died in Mont Doré Military Hospital, Bournemouth, on 22nd May, 1918, aged 49. He was the youngest son of the late Judge Stephen, of Lincoln, and was educated at Guy's Hospital, taking the M. R. C. S. and L. R. C. P., London, in 1897, after which he filled the posts of Resident Clinical Assistant at Leicester Infirmary, and of Resident Medical Officer at the Royal Isle of Wight Hospital; and served as a Civil Surgeon in the South African Field Force, receiving the medal. He took a temporary commission as Lieutenant in the R.A.M.C. on 10th August, 1914, in the first week of the war, and was promoted to Captain on completion of a year's service.

Lieutenant-Colonel Francis Wyrille Thomson, Bengal Medical Service, retired, died suddenly at Borside, Linlithgow, on 27th May, 1918. He was the only son of the late Sir Charles Wyrille Thomson, professor of Natural History in Edinburgh University, and was born on 7th February, 1860, and educated at that University, where he graduated as M.A. in 1880, and as M.B. and Ch.M. in 1886; also taking the D.P.H. of the Royal College of Surgeons, Edinburgh, in 1892, and the Liverpool Diploma in Tropical Medicine in 1905: entering the I.M.S. as Surgeon on 30th September, 1886, he became Major on 30th September, 1898, and Lieutenant-Colonel on 30th September, 1906, retiring on 14th March, 1908. He served in the North-West Frontier of India, in the campaign in Waziristan in 1894-95 (medal and clasp), in the third China War in 1900, including the relief of Peking (medal and clasp), and again in the Waziri campaign of 1901-02 (medal with clasp). During the present war he had been serving as Senior Medical Officer of the Tey defences. Most of his service in India was spent in military employment.

Major Edward John Elliot, R.A.M.C., was killed on 25th May, 1918, aged 37. He came of an old Border family and was the sixth owner in direct succession of the estate of Binks, Roxburgh County. He was born on 5th May, 1881, and educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1904, afterwards holding the post of House Surgeon of the Radcliffe Infirmary, Oxford. He entered the R.A.M.C. as Lieutenant on 30th July, 1906, gaining the Parkes Memorial Medal in Hygiene, while at the R.A.M.C. College he became Captain on 30th January, 1910.

and had recently been promoted to Major. After serving in China, he went to France in August, 1914, and was mentioned in despatches in January, 1916.

Staff-Surgeon Cecil Robert Marshhead Baker, R.N., died suddenly at H. M.'s training establishment, Shotley, on 25th May, 1918, aged 37. He was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1906, entered the Navy as Surgeon on 14th May, 1907, and became Staff-Surgeon in 1915.

Captain Ivan Clarkson Maclean, D.S.O., M.C., R.A.M.C., died of wounds as a prisoner in a German hospital on 4th April, 1918, having previously been reported as missing on 24th March. He was the son of the late Major-General H. L. Maclean, Rifle Brigade, and was educated at Haileybury and at St. Thomas' Hospital, taking the M.R.C.S. and L.R.C.P., London, in 1906, the M.B. and B.S., London, in the same year, and the M.D. in 1909. He subsequently filled the posts of Assistant in the X-Ray and in the Children's Surgical Department at St. Thomas', of House Physician at the Brompton Consumption Hospital, and of Anaesthetist to the Royal Ear Hospital, Siho. He then went into practice at Knight's Bridge, London, (holding the appointments of Anaesthetist to the Golden Square Hospital and of Honorary Medical Officer to the Actors' Association. He took a temporary commission as Lieutenant in the R.A.M.C. on 19th August, 1914, and was promoted to Captain after a year's service. Most of the last 3½ years he had spent in France, attached to his father's old regiment, the Rifle Brigade. He received the Military Cross for Neuve Chapelle on 25th June, 1915, a bar for the battle of the Somme on 21st December, 1916, and the D.S.O. for the third battle of Ypres on 26th September, 1917. He was severely wounded at Ypres, but went back to the front in January, 1918. His younger brother, Lieutenant A. C. Maclean, R.E., was killed on 9th April.

Lieutenant W. E. Brown, R.A.M.C., was reported as having died of wounds in the casualty list published on 29th May, 1918. He was attached to the Duke of Wellington's the West Riding Regiment.

Colonel Alexander Porter, Madras Medical Service, retired, died in London on 30th May, 1918. He graduated as M.D. of the Queen's University, Ireland, in 1864, also taking the L.R.C.S.I. in 1864, and the F.R.C.S.I. in 1872. Entering the I.M.S. as Assistant Surgeon on 1st April, 1865, after the service had been closed for 5 years, he became Surgeon on 1st July, 1873, Surgeon-Major on 2nd April, 1877, Brigade Surgeon on 19th August, 1886, and Surgeon-Colonel on 25th July, 1890, retiring on 10th July, 1895. All of his service, previous to his promotion to the administrative grade, was spent in civil employment. From 1866 to 1874 he was Civil Surgeon of Akola, in Berar, with an interval when he acted as Sanitary Commissioner of Berar in 1870-71; in April 1874 he became Chemical Examiner to the Government of Madras, and Professor of Chemistry in the Madras Medical College; and in December, 1886, became Principal of the College and Professor of Medicine. He was the author of a work, based on experience in the Great Madras Famine of 1877, "Notes on the Pathology of Famine Diseases."

The following promotions are made, subject to His Majesty's approval:—

*Captains to be Majors:* Dated 1st March, 1918.—John Taylor, D.S.O., M.D.; Alexander Dron Stewart, M.D.; Robert Henry Bott, M.B., F.R.C.S.; John Morison, M.B.; Samuel George Steele Houghton, M.B.; Francis William Cragg, M.D.; George McGregor Millar, M.B.; and Harold Hay Thorburn, C.I.E., M.D. Dated 4th April 1918.—James Smalley and Francis Hugh Salishury, M.B.

THE promotion to present rank of the undermentioned temporary Captains is antedated as shown against their names, subject to His Majesty's approval:—

Kamberanda Kariapa Mandana (deceased) from 27th October, 1916, to 27th October, 1915; Percy Stanley Blaker, from 27th November, 1916, to 5th November, 1915; Bager Zainulabidin Shah, from 5th November, 1916, to 5th November, 1915; Shripat Govind Ranadaya, from 19th May, 1916 to 19th November, 1915; Jehangir Kaikhosro Nariman, from 23rd November, 1916, to 23rd November, 1915; Richard Charles Palmer Berryman, from 24th November, 1916 to 24th November, 1915; Arthur Williams, from 26th November, 1916, to 26th November, 1915; Upendra Nath Banerjee, from 26th September, 1916, to 8th May, 1916.

THE undermentioned temporary Lieutenants to be temporary Captains with effect from the dates noted against their names, subject to His Majesty's approval:—

Vinayak Mahadeo Pahtak, 8th October, 1915; Jehangir Hormusji Onawalla, Syama Prosanna Gupta (resigned), and Rustom Mancherji Postwalla, 18th October, 1915; Shivax Ardeshir, Paymaster, 31st October, 1915; Vaman Raghunath Mirajkar, 5th November, 1915; Alexander John D'Souza, 5th November, 1915; Prem Nath Berry, M.B., Abdul Hamid Shaikh, M.B., Sorabji Byramji Warden, M.B., Lovji Shapurji Modi, F.R., C.S.I., Surendra Mohan Ghosh, and Jehangir Pestonjee Canteenwalla, 15th November, 1915; Charles Stiebel, M.B., F.R.C.S.E. (killed in action), 17th November,

1915; Phirozeshaw Jamshedji Kolaporewalla, 20th November, 1915; Sakria Nath Chaudhuri (resigned), and Devarayadrury Venkata Giri, 23rd November, 1915; Kaikhosro Byramji Bharucha, Erach Ruttanji Daboo, M.C., M.B., Noshervan Hormusji Bamboat, Naran Lakshman Sheorey, M.B., Phiron Fromji Laskari, M.B., Ignatius James Oookle Khaw, M.B., and Ganapathi Buntwal Mallya, 26th November, 1915; Kaikhosro Bezouji Kanga, F.R.C.S.E. (resigned), 30th November, 1915; Behram Pestonjee Sabawala, F.R.C.S. (resigned), 1st December, 1915; Bindashwari Prasad, M.B., Jotindra Mohan Das Gupta, M.B. (resigned), Maung Ba Yin, M.B., Satyendranath Roy, M.B., F.R.C.S.E. (resigned), and Probodhchandra Banerjee, 2nd December, 1915; Kaikhosro Keraspiji Dadachanji (resigned), 3rd December, 1915; Shiwx Sorbji Banker, 5th December, 1915; Sadhashiv Vaman Bhat, 7th December, 1915; Sobha Ram Kapoor (resigned), 8th December, 1915; William St. Clair Thwaites, M.B., Kanhaya Lal Kapur, M.B., and Stephen Ramchander Rao, 9th December, 1915; Codanda Madiah Ganapathy, M.B., and Madan Gopal Bhahdari, M.B., 14th December, 1915; Nariman Jamshedji Gai, M.B., 20th December, 1915; Vinayak Balvant Gokhale, Shrinivas Vitthal Kirtane (resigned), Ali Azhar Hasanally Fyzee, Jehangir Eadalji Spencer (resigned), Rustom Kershasp Dadachanji, F.R.C.S.E., Framji Sorabji Master, Sorab Dinsha Billimoria, Kowasha Kharshedji Melita, M.B., and J. Nassaroorji Hormasji Choksy, M.B., and Bailey Clemice Valerio Dias, 4th January, 1916; Ramrao Narayan Ajinkya, M.B., 12th February, 1916; Tottakkat Krishna Menon, M.B., 19th February, 1916; Mani Shanker Joshi, 25th February, 1916; James Hales Parry, 9th March 1916; F.M.P. Kesava Menon, 26th March, 1916; Phanindra Krishna Gupta, Nirlatan Chatterjee, and Pramath Nath Ghosh, 8th May, 1916; Vinayak Narayan Agate, M.B., 11th May, 1916; Sarat Chandra Mitra, M.B. (resigned), 13th May, 1916; Cuthbert Edward Rohan Norman, 14th May, 1916; Ram Chandra Malhotra, M.B., 15th May, 1916; Hemi Shivax Dastur and Rustom Burjetji Spencer, M.B., 17th May, 1916; Framroze Manackji Vajifdar (resigned), and Balajipetah Sesha Chalam, 18th May, 1916; Henry Anug Khin, M.B., 19th May, 1916; Samranendra Lal Mitra, M.B., and Edward Alexander Mario Joachim Goldie, 20th May, 1916; Shridhar Chintaman Jog, 21st May, 1916; Braj Bushan Kapila, M.B., 4th June, 1916; Pirojsha Merwanjee Antia, M.B. (resigned), and Manscooke Merwanjee Cowasjee (resigned), 25th May, 1916; Sorab Nusservanji Forbes, M.B., 9th June, 1916; Narain Rana Rao Ubhaya, 14th June, 1916; Caetano Joseph Fernandez, 19th June, 1916; Ardeshir Behramshah Pestonji, F.R.C.S.E., and Nariman Byramji Mehta, 21st June, 1916; Said Shamsuddin Mahamadi, M.B. (resigned), 24th June, 1916; Malik Anup Singh, M.B., 27th June, 1916; Frederick Honarato Noronha, M.B., 5th July, 1916; Sorab Orshedji Contractor, M.B., 14th July, 1916; Hormazshaw Jamshedji Wadia, M.B., 17th July, 1916; Naranji Ranchodji Naik, 23rd July, 1916; Khojrooy Kansji Patel, 29th July, 1916; Sorbji Manokji Kaka (resigned), 30th July, 1916; Anant Yeshwant Dabholkar, M.C., M.B., 2nd August, 1916; Raghunath Anandoo Barne (resigned), 3rd August, 1916; Samuel Jay Kotak (resigned), 4th August, 1916; Pascal John de Sousa, Alexander da Fonseca Dias (resigned), and Gangadrum Venkataswamy Ram Mohan, M.B., 6th August, 1916; Venkatrao Manjunath Kaikini, M.B., Satis Chandra Sen Gupta, M.D., F.R.C.S., Kashibhai Vaghajihai Amin, Kekhasree Sorabji Master, M.B., and Aaron Joseph, M.B., 10th August, 1916; Chandiram Hassomal Primalani, M.B., and Raj Jagannath Luthera, M.B., 13th August, 1916; Shanker Keshav Phadke, M.B., 20th August, 1916; Rustim Edulji Dadachanji, M.B., 21st August, 1916; Ram Nath Khosla, M.B., 23rd August, 1916; Joseph Robert Gwynne, 23rd August, 1916; Hem Chandra Roy Chowdhury, 25th August, 1916; Ratenshaw Nariman Kapadia, M.B., 25th August, 1916; Huggaballi Sundara Rajan, M.B., 26th August, 1916; Sudhir Kumar Bose, M.B., 28th August, 1916; Leo Sigaray en Machado, F.R.C.S.I., 2nd September, 1916; Arun Chandra Dutta, M.B., 8th September, 1916; Nalin Bihari Aich, M.B., 9th September, 1916; Suhrata Chander Sen, M.B., 11th September, 1916; Saradindu Bhusan Mukerjee, M.B., 13th September, 1916; Jagannath Vishnu Shirgaonkar, 14th September, 1916; Pestonji Rustomji Vakil, M.B., 4th October, 1916; Angus MacInnes Ramsay, M.B., 17th October, 1916; Vasimal Murlidhar Kanal, M.B., 17th October, 1916; Manohar Lal Dhawan, M.B., 28th October, 1916; Byram Sorabji Dhondy M.B., 28th October, 1916; Yedatore Venkoba Krishna-moorthy, M.B., 29th October, 1916; Balkrishna, M.B., 1st November, 1916; Balwant Rai, F.R.C.S.I. (resigned), 11th December, 1916; Paul Xavier Godinho, 17th December, 1916; Shridhar Bheekajee Gadgil, 17th December, 1916; Vinayak Laxman Satho, F.R.C.S.E., 24th December, 1916; Ramchandra Narayan Karode, 24th December, 1916; Kavalam Padmana-ha Panikkar, M.B., 1st January, 1917; Jyotiprosas Sirkar (resigned), 3rd January, 1917; Anthony Dias (resigned), 13th January, 1917; Mahadev Subramanyam, M.B., 18th

\* To take precedence from 16th July, 1916, on re-engagement.

† To take precedence from 1st June, 1916, on re-engagement.

January, 1917; Ramchander Kaushash, 14th February, 1917; Jatis Chander Chukerbutti, M.B., 17th February, 1917; Saroj Kumar Sanyal (resigned), 19th February, 1917; Bangalore Pasupuleti Balukrishna Naidu, M.B., 19th February, 1917; Dhanjishaw Phirozeshaw Karaka, 19th February, 1917; Arthur William Pantón, M.B., 19th February, 1917; Abani Mohan Ghosh, M.B., 19th February, 1917; Bhumonjee Norojee Burjorjee, M.B., 20th February, 1917; Nariman B. Kalsavala, 26th February, 1917; Chembil Vittil Appunni Menon, 26th February, 1917; Arthur Charles Lodge La Frenais, 4th March, 1917; Narendranath Dutta, M.B., 10th March, 1917; Sukumar Nag, M.B., 10th March, 1917; Jesudason Sellyah David, 11th March, 1917; Munguldas Tuljaram Khandwalla, M.B., 11th March, 1917; Kalyanpur Harihar Bhat, 11th March, 1917; Premrai Trambakrai Majumdar, 7th April, 1917; Palathunkal Mathen Matthai, 17th April, 1917; Albert Francis Winnington-da-Costa, 20th May, 1917; Indra Datt Gupta, 23rd May, 1917; Ikram Ali Sufi, 24th May, 1917; Dhanjishaw Dorabji Mogul, 27th May, 1917; Manohar Lal Bhagat, M.B., 31st May, 1917; Kripa Sundar Basu, 1st June, 1917; Gopal Das Mallhountra, 3rd June, 1917; Manohar Lal Bhargava, M.B., 5th June, 1917; Narendra Singh Bhai, 6th June, 1917; Ram Naran Sewal, 6th June, 1917; Yajaman Viswanath Ayya, 6th June, 1917; Jehangir Ratanji Wadia, 6th June, 1917; Majaraj Das, 7th June, 1917; Narayenrao Marntirao Chavan, 7th June, 1917; Shripad Bhaskar Gothaskar, M.B., 10th June, 1917; Dadabhoy Dinshaw Variava, M.B., 10th June, 1917; Kharg Bahadur Singh Kharkhi, 10th June, 1917; Frank Rodrigues, 10th June, 1917; Gokal Prosad Tiwari, 11th June, 1917; Jay Gopal Mukerji, 12th June, 1917; Gerald Secluna, 12th June, 1917; Muqattal Damodardas Munim, 12th June, 1917; Ignatius Fonseca, 13th June, 1917; William Austin Reardon, 13th June, 1917; Probbhat Chandra Mukerji, 13th June, 1917; Girdharilal Dharmdas Mohita, 14th June, 1917; Royapuram Nellaveran Raja, 14th June, 1917; Bsardas Bulchand Gidwani, M.B., 14th June, 1917; Mithilesh Chandra Ghosh, 14th June, 1917; Hari Pada Mukerji, 15th June, 1917; Narayan Ram Chandra Summanwar, M.B., 16th June, 1917; Ram Narayan, 16th June, 1917; Pennathur Krishnaswami, M.B., 17th June, 1917; Nathaniel Benjamin Morris, 17th June, 1917; Nadkarni Mangesh Rao, M.B., 17th June, 1917; Dharm Chand Nangpaul, M.B., 17th June, 1917; Terunageswaram Valaydam Pillai Rajaratnam, M.B., 18th June, 1917; Nellayappa Navanitha Krishnan, M.B., 18th June, 1917; Jotindranath Chowdhury, 19th June, 1917; Ardeshir Dadabhoy Shroff, M.B., 19th June, 1917; Sadasheo Gopal Paonaskar, M.B., 19th June, 1917; Tirath Ram Khanna, M.B., 20th June, 1917; Gurdas Ram, 22nd June, 1917; Shridhar Atmaram Phatak, 23rd June, 1917; Shyam Behari Lal, 23rd June, 1917; Som Dutt, 24th June, 1917; Suresh Chandra Mukerjee, 24th June, 1917; Arunaphala Sastriar Krishnamurthi, M.B., 25th June, 1917; Nain Singh, 25th June, 1917; Bhaskar Ramchandra Chandorkar, 27th June, 1917; Rustom Pestonjee, 5th July, 1917; Chandragiri Rangabhashyam, M.B., 7th July, 1917; Benarsi Das, M.B., 8th July, 1917; Prem Nath Dogra, M.B., 8th July, 1917; Munshi Ram Gupta, M.B., 11th July, 1917; L. Htin Poh, 14th July, 1917; Vidya Bhusan, M.B., 15th July, 1917; Piyaara Lal Bhal, M.B., 16th July, 1917; Manekshaw Dady, 17th July, 1917; Dharendra Nath Gupta, 19th July, 1917; Lal Chand Khanna, M.B., 20th July, 1917; Edwin Walter Marsh, 25th July, 1917; Bhagwan Das Uberoi, M.B., 26th July, 1917; Joseph Clement Sampson, 26th July, 1917; Ampattu Thomas Kuriyan, 4th August, 1917; Madan Lal Rikhyia, M.B., 8th August, 1917; Ganesh Das Kapur, M.B., 12th August, 1917; Syed Habib Ullah Shah, M.B., 13th August, 1917; Noormahomed Kasembhai Chohan, 14th August, 1917; Kripal Singh Thapar, M.B., 15th August, 1917; Mohamad Abdur Rashid, 15th August, 1917; Santokh Singh, M.B., 15th August, 1917; Gurdas Ram Oberai, M.B., 19th August, 1917; Daya Ram Kumar, M.B., 21st August, 1917; Jagadish Chandra, M.B., 21st August, 1917; Abdul Hamid Butt, M.B., 21st August, 1917; Mohamed Abdulla, M.B., 23rd August, 1917; Amar Singh Dogra, M.B., 30th August, 1917; Parmeshwari Das, 1st September, 1917; Madhava Krishna Pillai, M.B., 4th September, 1917; Teja Singh Uberoi, M.B., 5th September, 1917; Pyare Lal Tandan, 7th September, 1917; Pyare Lal Tandan, 11th September, 1917; Amar Chand Mehra, M.B., 16th September, 1917; Jagat Ram Kochhar, M.B., 16th September, 1917; Mysore Seshagiri Rao Krishnaswami Rao, M.B., 16th September, 1917; Girdharilal Nijhawan, M.B., 17th September, 1917; Jibanratnam Dhar, M.B., 18th September, 1917; Kalkhashru Hormasji Contractor, M.B., 22nd September, 1917; Gulam Ahmed Khan, M.B., 23rd September, 1917; Shamrao Waman Mahatro, 25th September, 1917; Sheikh Gulam Rasul, 25th September, 1917; Jermandas Khataimal Kripalani, 26th September, 1917; Vesudev Kashinath Apte, 26th September, 1917; Ramchandra Bhima Subramanyam, 26th September, 1917; Manchershah Ardeshir Mithavala, 29th September, 1917; Purna Chandra Chowdbury, M.B., 30th September, 1917; Raj Kishore Kacker, 1st October, 1917; Nusservanji Hormasji Vakil, 1st October, 1917; Kaikobad Rustomjee Madan, 1st October, 1917; Jehangir Cowasjee Driver, 4th October, 1917; Vasudeo Bhanrao Gupte, 6th

October, 1917; Vasudeo Gopal Bhandare, 5th October, 1917; Jatindra Mohan Mitra, 7th October, 1917; Shivshankar Krishna Hattiangadi, 13th October, 1917; Aloysius Xavier Pereira, 15th October, 1917; Phiroz Rustomji Kapadia, 20th October, 1917; Sarat Chandra Basu, 21st October, 1917; Framroz Cursedji Desai (deceased), 25th October, 1917; Anant Krishnaji Nulkor, 31st October, 1917; Frederic Bert-ram DeSouza, 2nd November, 1917; Ardeshir Byramji Mistri, 2nd November, 1917; Muthu Ramkrishna Grandhi, M.B., 3rd November, 1917; Bishendas Soni (resigned), 7th November, 1917; Rudra Datta, 7th November, 1917; William George Miller, 8th November, 1917; Vishnu Kashinath Parab, 8th November, 1917; Nilmoni Maitra, 18th November, 1917; Vishnu Balchandra Bapat, 22nd November, 1917; Himansue Sekher Banerjee, 1st December, 1917; Gulam Ali Miri, 2nd December, 1917; Phiroz Palanji Daruwalla, 8th December, 1917; Dinkar Narayan Varde, 8th December, 1917; George Albert Hildreth, M.B., 11th December, 1917; Amrita Nath Banerji, M.B., 13th December, 1917; Khanderao Krishna Rao Dhairyawan, 18th December, 1917; Jal Dinshawaji Darnwalla, 18th December, 1917.

THE undermentioned honorary temporary Lieutenants to be honorary temporary Captains, with effect from the dates noted, subject to His Majesty's approval:—  
Kaikhosru Ardeshir Darukhanawala, 1st June, 1917; Sarat Kumar Chaudhuri, 6th August, 1917.

#### Indian Subordinate Medical Department.

THE undermentioned 4th class Assistant Surgeons, having completed seven years' service in that class, to be 3rd class Assistant Surgeons, with effect from the 23rd June, 1918:—

Francis Herbert Johnson, John Cecil Mendis, and Algernon Benjamin Donowan.

C. CELESTIAN, 2nd class Sub-Assistant Surgeon, having completed five years' service in that class, and passed the required departmental examination, to be 1st class Sub-Assistant Surgeon, with effect from the 15th June, 1918.

THE Governor-General in Council is pleased to sanction the grant of the following rewards for acts of gallantry or devotion to duty in the field.

#### Awarded the Indian Distinguished Service Medal.

First class Civil Sub-Assistant Surgeon Mehdi Hassan Khan, Indian Subordinate Medical Department, United Provinces.

Second class Senior Sub-Assistant Surgeon Bir Singh, Indian Subordinate Medical Department, Bengal.

#### Awarded the Meritorious Service Medal (without annuity).

First class Sub-Assistant Surgeon Mulchand Sharma, Indian Subordinate Medical Department, Bengal.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, I.M.S., with effect from the dates specified:—

Nagendra Nath Saha, 6th June, 1918; Ragbir Singh Bhargawa, 12th June, 1918; Anegondi Seshagiri Venkata Rao, 14th June, 1918; and Salil Nath Bhattacharji, 17th June, 1918.

GRANT of staff pay to officers of the Royal Army Medical Corps and Indian Medical Service appointed to the charge of Divisions of General and War hospitals of 1,000 beds and over.

Sanction is accorded to the grant of staff pay at Rs. 300 per mensem, in addition to Indian Medical Service grade pay, to officers of the Royal Army Medical Corps and Indian Medical Service appointed to the charge of Divisions of General and War hospitals of 1,000 beds and over.

The scale on which officers will be appointed is as follows:—

|                     |             |
|---------------------|-------------|
| 1,000 to 1,999 beds | 2 officers. |
| 2,000 to 2,999 beds | 4 "         |
| 3,000 beds and over | 6 "         |

In the case of Nos. 34 (The Welsh), and 44 British General Hospitals, Deolali, those orders will have effect from the dates of arrival of those units in India.

TERMS for the re-engagement of temporary officers of the Indian Medical Service:—

It has been decided that the following classes of temporary officers of the Indian Medical Service may be permitted to re-engage under the terms of Army Department letter No. H.S.-397, dated 9th February, 1915, provided they have been continuously employed since their first appointment:—

(a) those who were engaged by the Director-General, Indian Medical Service, for service overseas prior to the issue of the letter quoted above, as well as those engaged under the terms of that letter;

(b) those who were engaged by the Bombay Relief Fund for service in Egypt and subsequently re-engaged by the Government of India.



The officers referred to above should accordingly be paid at the rate of 24 shillings per diem whether serving in India or overseas.

**PAY** and allowances of the Commandant and Adjutant of the School of Instruction for temporary officers of the Indian Medical Service:—

It has been decided that in supersession of the rates of pay authorised for the Commandant and the Adjutant of the School of Instruction for temporary officers of the Indian Medical Service in clause (8) of the appendix to Army Instruction (India), No. 414 of 1918, the following rates of staff pay will be admissible in addition to grade pay:—

Commandant, Indian Medical Service.—

|                                  |                     |
|----------------------------------|---------------------|
| If a selected Lieutenant-Colonel | Rs. 450 per mensem. |
| If a Lieutenant-Colonel          | ... " 400 " " "     |
| If a Major                       | ... " 350 " " "     |
| Adjutant                         | ... " 200 " " "     |

2. The above orders will be applicable to the present incumbents of the posts of Commandant and Adjutant of the school with effect from the dates on which they took up their appointments.

*The London Gazette* of 27th July announced the award of C. M. G. to Lieut.-Col. R. G. Turner, D.S.O., F.R.C.S., I.M.S., for distinguished services in East Africa; and the M. C. to Capt. J. B. Lapsley, F.R.C.S., I.M.S.

**SANCTION** to recipients of the Indian Distinguished Service Medal placing the letters "I. D. S. M." after their names:—

It has been decided, with the approval of the Right Hon'ble the Secretary of State for India, that Indian officers, non-commissioned officers and men who have been awarded the Indian Distinguished Service Medal shall be entitled to add the distinctive letters "I. D. S. M." after their names, and that in all documents, registers, reports, correspondence, etc., the descriptions of individuals should include these particulars.

2. Officers Commanding should forward direct to the Military Secretary to His Excellency the Commander-in-Chief in India (marking the envelope in the top left-hand corner *Army List*), lists of Indian officers under their command who are entitled to use the letters "I. D. S. M." after their names, giving in each case the rank and unit at the time of award, the theatre of war in which the medal was earned and the Gazette notification authorizing the award.

**RATE** of exchange for calculating subscriptions and contributions to, and payments in India from, the Indian Military Service Family Pension Fund and the Indian Military Widows' and Orphans' Fund:—

It is notified that the Secretary of State for India has decided that, with effect from the 1st December, 1917, contributions (including donations and disparity fines) to the Indian Military Service Family Pension Fund and the Indian Military Widows' and Orphans' Fund shall be recovered at the rate of exchange, fixed from time to time, for calculating exchange compensation allowance. This rate will be calculated by the Controller of Currency each quarter and notified by him along with the percentage of salary admissible as exchange compensation allowance about the 15th day of the final month in the preceding quarter. The rates for the period from 1st December, 1917, to 30th September, 1918, will be separately notified by him at an early date.

2. Pension payments in India from these funds should continue to be made at the official rate of exchange which at present is 1s. 4d. the rupee.

**PROMOTION** of Lieutenants of the Indian Medical Service:—

With reference to Army Instruction (India), No. 62 of 1918, it has been decided, with the approval of the Right Hon'ble the Secretary of State for India, to adopt the following further temporary measures for the promotion of Lieutenants of the Indian Medical Service:—

(1) Temporary Lieutenants of the Indian Medical Service will, provided they are favourably reported on, be promoted to the rank of Captain after 12 months' service irrespective of date of appointment.

(2) Those granted permanent commissions in the Indian Medical Service by nomination, if already holding the rank of Captain, or after 12 months' service, will be granted the pay and temporary rank of Captain for the duration of the war subject to the proviso that promotion should not bear date prior to 17th July, 1916.

(3) Those appointed permanently on or after the 1st January, 1917, and who have to complete three years' service before attaining the substantive rank of Captain will be permitted to reckon for substantive promotion any commissioned mobilized service rendered since the outbreak of the war.

**COMPENSATION** in lieu of quarters to the families of sub-assistant surgeons who are on field or foreign service when such families reside in Presidency towns:—

With reference to paragraph 1 (iii) of Army Department Notification No. 870, dated the 1st June, 1917, it has been decided that the families of sub-assistant surgeons, who are on field or foreign service, shall be granted 50 per cent. extra compensation in lieu of quarters when residing in Presidency towns.

2. This decision has effect from the 18th April, 1917.

3. The cost involved will be debitable to the ordinary grant and head of account affected.

**COLONEL G. J. H. BELL, C.I.E., I.M.S.**, Inspector-General of Civil Hospitals, Bihar and Orissa, is granted, with effect from the 15th June, 1918, or any subsequent date on which he may avail himself of it, combined leave for six months, viz., privilege leave for 3 months under articles 260 and 233 of the Civil Service Regulations, and thereafter leave on Medical Certificate under paragraph 226, Army Regulations, India, Volume II.

Lieutenant-Colonel J. C. S. Vaughan, M.B., I.M.S., Civil Surgeon, Ranchi, is appointed to officiate as Inspector-General of Civil Hospitals, Bihar and Orissa, during the absence on leave of Colonel G. J. H. Bell, C.I.E., I.M.S., with effect from the date on which he assumes charge of these duties.

THE services of Major N. W. Mackworth, M.B., F.R.C.S.E., I.M.S., are placed permanently at the disposal of the Government of Bihar and Orissa, with effect from the 18th April, 1918. His services will remain temporarily at the disposal of His Excellency the Commander-in-Chief in India.

IN pursuance of section 3 of the Indian Medical Degrees Act, 1916 (VII of 1916), the Governor-General in Council is pleased to authorise the Assam Medical Examination Board to license as medical practitioners those students of the Berry-White Medical School at Dibrugarh who passed the qualifying tests prescribed for the school in medicine, surgery and midwifery during the period between the passing of the said Act on the 16th March, 1916, and the constitution of the said Board on the 11th January, 1918.

**LIEUTENANT-COLONEL P. B. HAIG**, Indian Medical Service (Bengal), an Agency Surgeon of the 2nd class, is appointed to officiate as an Agency Surgeon of the 1st Class, and is posted as Civil Surgeon, Ajmer, and Chief Medical Officer in Rajputana, with effect from the 12th June, 1918, and until further orders.

**SUBJECT** to His Majesty's approval, the undermentioned to be temporary Lieutenants, I. M. S., with effect from the dates specified:—

Madho Prasad Bhargava, 20th April, 1918; Prabhakar Shankor Gupte, 24th May, 1918; Krishna Das Mukharji, 4th June, 1918.

**SUBJECT** to His Majesty's approval, Lieutenant-Colonel Henry Albert John Gidney, F.R.C.S.E., I.M.S., is permitted to retire from the service on account of ill-health, with effect from the 1st July, 1918.

IN recognition of meritorious service in Mesopotamia under the late Sir S. Maude the following honours have been conferred (India Office, 24th April—Government of India, 6th July, 1918):—

C. I. E. (1) Brevet-Lieutenant-Colonel C. M. Goodbody, D.S.O., F.R.C.S.I., I.M.S. (his third award in the War).

(2) Major (temporary Lieutenant-Colonel) J. G. G. Swan, I.M.S.

(3) Major W. D. H. Stevenson, M.D., I.M.S.

THE following promotion is made, subject to His Majesty's approval:—

*To be Colonel.*

Lieutenant-Colonel Robert Charles McWatt, C.I.E., M.B., F.R.C.S., *vice* Colonel W. H. B. Robinson, C.B., promoted Surgeon-General, with effect from the 8th January, 1918.

Colonel McWatt's tenure of appointment will reckon from the 20th June, 1918. He has now taken over the duties of I. G. of Civil Hospitals, Punjab, *vice* Colonel Headley promoted to be Surgeon-General.

*Bengal Establishment.*

**EBENEZER LIONEL HUGH SHAW**, 3rd class assistant Surgeon, having completed five years' service in that class, to be 2nd class Assistant Surgeon, with effect from the 1st June, 1918.

**LIEUTENANT-COLONEL B. H. DEARE, I.M.S.**, Professor of Clinical Medicine and Materia Medica, Medical College, Calcutta, and Second Physician, Medical College Hospital, is granted combined leave for 4 months and 15 days, viz.

privilege leave for such period as may be due and furlough for the remaining period, with effect from the date on which he makes over charge of his duties.

MAJOR D. MCCAV, M.D., I.M.S., Professor of Physiology, Medical College, Calcutta, is appointed to officiate as Professor of Clinical Medicine and Materia Medica, Medical College, Calcutta, and Second Physician, Medical College Hospitals, during the absence on leave of Lieutenant-Colonel B. H. Deare, I.M.S., or until further orders.

THE services of the undermentioned officers are replaced at the disposal of the Government of Bengal:—

Major W. V. Coppinger, M.D., F.R.C.S.I., I.M.S.

Captain V. B. Green-Armytage, M.D., I.M.S.

Captain J. A. Shorten, M.B., I.M.S.

THE services of Major J. Kirkwood, M.D., F.R.C.S.E., I.M.S., are replaced at the disposal of the Government.

MAJOR CHARLES S. LOWSON, M.B., I.M.S., is permitted to retire, with effect from 27th July, 1917. He entered the service on 27th July, 1899.

CAPTAIN C. H. HEPPESTALL, I.M.S., acts, in addition to his military duties, as Civil Surgeon of Dharmasala.

IN accordance with this Department's Order No. 72-I-A, dated the 9th February, 1918, the undermentioned Assistant Surgeons officiating as Civil Surgeons are appointed provisional substantive Civil Surgeons with effect from the 9th February, 1918, *vice* Indian Medical Service Officers and Military Assistant Surgeons deputed on military duty before or up to the 30th June, 1916:—

(1) Senior Grade Assistant Surgeon Waman Vithal Kane, B.A., L.M. & S., Officiating Civil Surgeon, Nimar.

(2) Senior Grade Assistant Surgeon Umacharan Ray, L.M. & S., Officiating Civil Surgeon, Yeotmal.

(3) Senior Grade Assistant Surgeon Rai Sahib Bipin Bihari Gupta, L.M. & S., Officiating Civil Surgeon, Raipur.

(4) Senior Grade Assistant Surgeon Sakharan Ganesh Paranjpe, L.M. & S., Officiating Civil Surgeon, Bilaspur.

(5) First Grade Assistant Surgeon Bhagwandas, L.M. & S., Officiating Civil Surgeon, Buldana.

(6) Second Grade Assistant Surgeon Trimbak Balwant Bhanage, L.M. & S., Officiating Civil Surgeon, Damoh.

(7) Second Grade Assistant Surgeon Ganpat Ramrao Govardhan, L.M. & S., Officiating Civil Surgeon, Balaghat.

(8) Third Grade Assistant Surgeon Subodh Chandra Mukherji, L.M. & S., Officiating Civil Surgeon, Mandla.

MR. JYOTISH CHANDRA GHOSE, B.Sc., F.C.S., Pharmaceutical Chemist, Government Medical Store Depot, Madras, is granted privilege leave for 16 days, combined with leave on medical certificate for 5 months and 15 days, with effect from the 6th May, 1918.

HIS Excellency the Governor of Bombay in Council has been pleased to make the following appointments during the absence of Reverend Dr. MacRae:—

Lieutenant-Colonel T. H. Foulkes, I.M.S., to act as Civil Surgeon, Aden, in addition to his military duties, with effect from the 18th February, 1918.

Major M. S. Irani, I.M.S., to act as Superintendent, Special Prison, Crater, in addition to his military duties, with effect from the 9th April, 1918.

THE services of Major M. H. Thornely, F.R.C.S.E., I.M.S. are replaced temporarily at the disposal of the Government of Bihar and Orissa.

THE services of Major W. E. McKechnie, M.B., I.M.S., are replaced temporarily at the disposal of the Government of the United Provinces.

THE services of Major R. F. Steel, M.B., F.R.C.S.E., I.M.S., are replaced at the disposal of the Government of Bombay.

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Minocher Cowasji Langrana, Indian Medical Service, have been dispensed with, on account of physical unsuitness, with effect from the 19th June, 1918.

LIEUTENANT-COLONEL A. BUCHANAN, M.A., M.D., M.Ch., M.A.O., I.M.S., Civil Surgeon, Pachmarhi, is re-posted to Nagpur.

The Chief Commissioner is pleased to appoint Lieutenant-Colonel A. Buchanan, M.A., M.D., M.Ch., M.A.O., I.M.S., Civil Surgeon, Nagpur, as Superintendent of the Lunatic Asylum, Nagpur.

The Chief Commissioner is also pleased to appoint Lieutenant-Colonel A. Buchanan, M.A., M.D., M.Ch., M.A.O., I.M.S., Civil Surgeon, Nagpur, as Superintendent of the Robertson Medical School, Nagpur.

On relief by Lieutenant-Colonel A. Buchanan, M.A., M.D., M.Ch., M.A.O., I.M.S., Honorary Captain M. Windross, I.S.M.D. (retired), temporary Civil Surgeon, Nagpur, is re-posted to Chhindwara as temporary Civil Surgeon.

THE following appointments are gazetted:—

#### Deputy Assistant Directors of Medical Services.

Captain J. S. McCombe, D.S.O., Royal Army Medical Corps, 25th February, 1913; Captain E. R. Armstrong, Indian Medical Service, 25th February, 1918; Captain R. F. Bridges, Royal Army Medical Corps, 25th February, 1918; Captain E. E. Doyle, Indian Medical Service, 25th February, 1918; Captain C. Ryles, Royal Army Medical Corps, 25th February, 1918; Captain D. Reynolds, Royal Army Medical Corps, 25th February, 1918; Captain C. H. H. Harold, Royal Army Medical Corps, 25th April, 1918; Captain A. F. Babonau, Indian Medical Service, 16th May, 1918; Captain S. J. Barry, Royal Army Medical Corps, 25th February, 1918; Captain C. A. Bignold, Royal Army Medical Corps, 18th June, 1918; Captain J. C. L. Hingston, Royal Army Medical Corps, 25th February, 1918; Captain D. B. McGregor, Royal Army Medical Corps, 25th February, 1918; Captain F. R. Coppinger, Royal Army Medical Corps, 25th February, 1918; Captain W. A. Spong, Royal Army Medical Corps, 25th February, 1918; Captain W. A. Dickson, Royal Army Medical Corps, 25th February, 1918; Captain W. B. Stevenson, Royal Army Medical Corps, 20th May, 1918; Captain A. D. Stewart, Indian Medical Service, 10th May, 1918; Captain F. W. Cragg, Indian Medical Service, 6th May, 1918.

THE following gentlemen have been appointed as temporary Civil Assistant Surgeons, with effect from the dates specified against their names:—

Mr. S. J. Jhirad, M.B., B.S., 7th April, 1918; Mr. P. S. Karnadkar, M.B., B.S., 19th April, 1918; Mr. S. A. Shah, L.M. & S., 28th April, 1918; Mr. G. R. Khandedia, M.B., B.S., 15th May, 1918.

DR. N. F. SURVEYOR, M.D., M.R.C.P. (Lond.), D.P.H. (Cantab.); Acting 2nd Physician, J. J. Hospital, and Professor of Materia Medica, G. M. College, has been granted privilege leave of absence for six weeks, with effect from the 15th April, 1918.

HIS Excellency the Governor in Council has been pleased to appoint Captain S. K. Engineer, I.M.S. (Hon.), to act as Second Physician, J. J. Hospital, and Professor of Materia Medica, Grant Medical College, during the absence on leave of Dr. N. F. Surveyor, M.D., M.R.C.P. (Lond.), D.P.H. (Cantab.).

HIS Excellency the Governor of Bombay in Council is pleased to appoint Lieutenant-Colonel A. Hooton, I.M.S., to act as Presidency Surgeon, First District.

HIS Excellency the Governor of Bombay in Council is pleased to make the following appointments during the absence of Lieutenant-Colonel H. Herbert (retired), F.R.C.S., I.M.S.:—

Major A. Cameron, I.M.S., to act as Civil Administrative Medical Officer, Sind, in addition to his military duties.

Major L. P. Stephen, I.M.S., to act as Civil Surgeon, Karachi, in addition to his military duties.

HIS Excellency the Governor of Bombay in Council is pleased to make the following appointments with effect from the 1st April, 1918:—

Assistant Surgeon Khan Bahadur R. J. Petigara, L.M. & S., to be Senior Assistant Surgeon, *vice* Senior Assistant Surgeon S. D. Bharucha, L.M. & S., retired.

Assistant Surgeon J. V. P. Mascarenhas, L.M. & S., to be substantive *pro tempore* Senior Assistant Surgeon, *vice* Assistant Surgeon Khan Bahadur R. J. Petigara, seconded.

Assistant Surgeon Khan Saheb C. R. Avari to be substantive *pro tempore* Senior Assistant Surgeon, *vice* Assistant Surgeon J. V. P. Mascarenhas, L.M. & S., seconded.

THE Governor-General in Council is pleased to sanction, under the provisions of paragraph 470, Army Regulations, India, Volume II, the special promotion, with effect from the 1st July, 1918, of the undermentioned Sub-Assistant Surgeon of the Indian Subordinate Medical Department, for services during the present war:—

No. 1110 1st class Sub-Assistant Surgeon Hakim Singh to be Senior Sub-Assistant Surgeon, 2nd class, ranking as Jemadar.

COLONEL R. ROBERTSON, I.M.S. (Madras), was permitted to retire on account of ill-health with effect from 30th June, 1918. Colonel Robertson entered the service on 31st March, 1887, and became Colonel on 1st May, 1914. He spent most of his career in Civil Medical employ in Madras.



THE following reward is granted for acts of gallantry or devotion to duty in the field :—

**2ND CLASS ORDER OF BRITISH INDIA, with title of BAHADUR.**

1st class Senior Sub-Assistant Surgeon Barkat Ram; 1st Class Senior Sub-Assistant Surgeon Karam Chand; 1st Class Senior Sub-Assistant Surgeon Niaz Ali Khan.

**INDIAN DISTINGUISHED SERVICE MEDAL.**

1st class Sub-Assistant Surgeon Kesar Singh; Bearer Venketaswamy, A. B. Corps; Bearer Angiah, A. B. Corps; Bearer Rathana, A. B. Corps; Lieutenant Havildar Agumi Mistri, A. B. Corps; Sub-Assistant Surgeon Mahommed Ishak, I.S.M.D.; Sub-Assistant Surgeon Salvadore Jasudasan, I.S.M.D.

BAR to above Medal.

Sub-Assistant Surgeon Chaman Lal; Lance-Naik Chayn Jay and Lance-Naik Sri Ram, A. B. Corps.

**INDIAN MEDICAL SERVICE.**

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified :—

Shiva Chandra Banerjee, 11th June, 1918; Therathawathu Cheriyan Mathew, 14th June, 1918; Atul Krishna Kar, 21st June, 1918; Amulya Chandra Roy, 25th June, 1918.

In Army Department Notification No. 1003, dated the 17th May, 1918, for "Hormusji Edulji Pithwala," read "Homi Edulji Variava."

THE services of Lieutenant-Colonel G. Bidia, M.D., F.R.C.S.E., I.M.S., are placed at the disposal of the Government of Madras, with effect from the date on which he is relieved of his military duties.

MAJOR A. E. WALTER, I.M.S., Superintendent of the X-Ray Institute, Dehra Dun, is granted privilege leave for two months, with effect from the 15th July, 1918, or the date on which he avails himself of it.

Captain B. Gale, M.B., I.M.S., is appointed to officiate as Superintendent of the X-Ray Institute, Dehra Dun, during the absence on leave of Major A. E. Walter, I.M.S., or until further orders.

**PROMOTIONS.**

THE following officers are granted, subject to His Majesty's approval, the temporary ranks specified, while holding the appointments noted :—

*Deputy Assistant Directors of Medical Services.*

Captain W. R. Stewart, Indian Medical Service, 23rd May, 1918; Captain R. B. Nicholson, Indian Medical Service, 12th March, 1918; Captain J. R. D. Wehb, Indian Medical Service, 25th February, 1918.

MAJOR N. S. HARVEY, I.S.M.D., Superintendent of Jails, Benares, privilege leave for six weeks, with effect from the 1st August, 1918, or from the date on which he may avail himself of the leave.

BABU SHEO CHAND KAPUR, Deputy Collector, to hold executive charge of the Central Jail and Lieutenant-Colonel J. M. Crawford, M.B., I.M.S., Civil Surgeon, to hold medical charge of the Central Jail and the executive and medical charge of the District Jail, Benares, in addition to their own duties, during the absence, on privilege leave, of Major N. S. Harvey, I.S.M.D.

SUBJECT to His Majesty's approval, Lieutenant-Colonel Arthur Gwyther, F.R.C.S.E., has been permitted by the Right Hon'ble the Secretary of State for India to retire from the service, with effect from the 29th January, 1918.

COLONEL H. E. BANATVALA, C.S.I., Indian Medical Service, is appointed an Hon. Surgeon to the King, *vice* Surgeon-General Sir C. P. Lukis, K.C.S.I., M.D., F.R.C.S. (dead), 22nd October, 1917.

THE following Notification by the Government of India, Home Department (Medical), is republished :—  
"No. 305, dated the 12th July, 1918.

The services of Major R. F. Steel, M.B., F.R.C.S.E., I.M.S., are replaced at the disposal of the Government of Bombay."

The services of the undermentioned officers are placed temporarily at the disposal of the Government of India :—

Lieutenant-Colonel E. F. G. Tucker, M.B., B.S., M.R.C.P. (Lond.), I.M.S.

Major W. H. Dickinson, M.B., B.Ch. (Edin.), I.M.S.

THE services of Lieutenant-Colonel J. G. Hojel, M.B., B.Ch. C.I.E., I.M.S., are placed at the disposal of the Government of India for employment on military duty.

WITH reference to Army Department Notification No. 9081, dated the 3rd May, 1918, it is notified that Surgeon-General Manifold's tenure of appointment will reckon from the 24th June, 1918.

THE undermentioned military pupils are admitted into the service, as temporary 4th class Assistant Surgeons, with effect from the 2nd July, 1918 :—

Feridun Melik-Beglar Burnett; Stanley Hugh Jamieson Coombs; Maximilian Ivan Van Greicken Quilivan Daniell; Arthur Alexander Rappa.

The order of seniority of all these subordinates is provisional.

**SUB-ASSISTANT SURGEON BRANCH.**

*Madras Establishment.*

THE undermentioned Indian military pupils, having passed their final examination, are admitted into the service as 3rd class Sub-Assistant Surgeons, with effect from the 4th March, 1918 :—

No. 1458 Talasheri Veettil Narayanan Nair.

No. 1459 Vellore Gangadara Ranganatham.

No. 1460 P. V. Viswanatha Iyar.

No. 1461 S. Ranganadham Pillai.

FOR the list of members of the Central Midwives Board for the Punjab as published in Notification No. 12536, dated the 19th June, 1918, substitute the following :—

(1) The Inspector-General of Civil Hospitals, Punjab, President.

(2) The Assistant to the Inspector-General of Civil Hospitals, Punjab, for the inspection of Women's Hospitals.

(3) The Professor of Midwifery, Medical College, Lahore.

(4) A Member of the Punjab Medical Council to be elected from time to time by the Council.

(5) A lady doctor to be co-opted by the Board from time to time as a vacancy occurs.

(6) A nurse to be co-opted by the Board from time to time as a vacancy occurs.

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Oriental Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage abroad.

## BOOKS, REPORTS, &c., RECEIVED :—

Indian Medical Missionary Handbook. Santal Mission Press. Re. 1.

Stream Pollution. Public Health Bulletin 87, Washington. U. S. A.

Moor and Pastridge's Aids to Analysis of Food and Drugs. (4th Ed.) Baillière Tindall & Cox.

The Medical Annual, 1918. J. Wright & Sons, Bristol. Price, 10s. nett.

M. Kanel Barradab, Permanganate in Venereal Disease, Cairo, 1918.

E. Doven's Surgical Therapeutics, &c. Vol. 2. (Engl. Ed.) Baillière Tindall & Cox.

Sanidad Y. Beneficencia, Habana, April No.

Report of Royal Botanic Garden, &c., Calcutta, 1918.

Lahore Health Report.

Madras Ophthalmic Hospital Report.

## LETTERS, COMMUNICATIONS, &c., RECEIVED FROM :—

Lt.-Col. J. T. Calvert, F.R.C.P., Calcutta; Col. Sheeo, Bombay; Lt.-Col. Vaughan, I.M.S., Ranchi; Capt. James, I.M.S.; Lt. Basu, I.M.S.; Dr. Winterbotham; Capt. Finny, R.A.M.C.; Lt. C. Reader, R.A.M.C., Mussoorie; Dr. I. Scudder, Vellore; Maj. Armstrong, I.M.S., Simla; Lt.-Col. Sprayson, I.M.S., Mesopotamia; Lt.-Col. F. P. Connor, D.S.O., Basra; Lt.-Col. Sprayson, I.M.S., Bagdad; Lt.-Col. P. Mackie, M.Sc., I.M.S., Bagdad; Maj. R. E. F. Austin, Calcutta; Dr. K. K. Chatterjee, Calcutta.

## Original Articles.

### SUNSTROKE OR HEATSTROKE?

BY CHARLES M. FINNY, M.D.,

CAPTAIN, R.A.M.C.

OF the various diseases encountered in hot countries there are none of greater interest from both a scientific and practical point of view than those produced by the climate.

The improved sanitation in India has greatly reduced the dangers of cholera, plague, enteric, etc., but the sun and the heat of the hot weather remain; yet, even among medical men, there is an extraordinary vagueness in respect of the diseases caused by these factors. The differences of classification in various works on tropical medicine show this, but the average point of view has been pithily summed up by Major Ogilvy, I.M.S., in the *R.A.M.C. Journal*, who says, "the general view seems to be that if the victim is bowled over in the sun it is called sunstroke, if in the shade it is called heat-stroke."

The present writer has tried to correlate the facts known concerning heatstroke and sunstroke by comparing the results of experiments and observations, and has made a number of further experiments to bridge over gaps in our knowledge of the subject.

It is hoped that the deductions arrived at may help towards a more rational appreciation of the part played by the sun in the production of heatstroke and its allied conditions.

Before discussing these diseases, it is necessary for their proper appreciation first to consider the climatic and atmospheric factors which may be responsible for their production.

These are:—

- (1) The intensity of the direct sun's rays.
- (2) The temperature of the air.
- (3) The percentage of moisture in the air.
- (4) Presence or absence of wind.

(1) The intensity of the sun's rays depend chiefly on the angle at which they strike the earth, not only because the intensity varies directly as the sine of the angle which the rays make with the horizontal, but because the more vertically the rays strike the ground, the less are they absorbed by the atmosphere. It has been calculated that only 20 per cent. of the heat rays are absorbed when the sun is overhead, whereas over 90 per cent. are absorbed when it has just risen.

The dryness of the atmosphere is also an important factor, as aqueous vapour is practically athermanous to heat rays. A solar radiation

thermometer shows that no radiant heat can pass through a cloud.

As some heat from the sun is absorbed by the air, it seems probable that more is absorbed by cold air than by hot. Some experiments conducted by the writer support this belief, showing that the sun's rays are hotter when the air has heated up than when it is relatively cool.

(2) Temperature of the air: This depends primarily on the heat of the sun's rays; consequently, conditions which lead to a high solar temperature tend to produce a high shade temperature also. A certain amount of heat is conveyed by the direct passage of the heat rays, but the air is chiefly warmed up by convection and radiation of heat rays from the ground.

The maximum heating effect is therefore found when the ground consists of rock or dry earth, when there are no clouds or moisture to check the sun's rays, and when the days are long and the nights short, and there is no wind.

Under these circumstances when there is no rain or moisture to cool the earth by evaporation, the only cooling which takes place is by radiation at night. During the Indian hot-weather this is not sufficient to counteract the heating effect of the sun by day, and so each morning the ground and the air above it start hotter and gain more heat during the day. Thus it goes on 'stoking up,' until a thunder-storm brings relief, or with the change of seasons the duration of the night exceeds that of the day.

Altitude has a remarkable effect on the temperature of the air. According to Herschel, it drops roughly 1°F. for every 300 feet ascended. This is apparently due to the decreased amount of earth to retain heat, and the greater rarefaction of the air which permits of more rapid radiation. In most hill stations in India these factors are assisted by the presence of vegetation, fairly frequent rainfall, and the fact that there is often a certain amount of wind coming from snow-capped mountains.

(3) The percentage of moisture in the air: As has been pointed out above, both clouds and moisture in the air check to a large extent the passage of the sun's heat rays, but clouds check also radiation from the ground and an atmosphere charged with moisture has a much more important effect, namely, that it interferes with evaporation from the human body.

Normally the body loses about 76 per cent. of its heat by radiation and conduction, 15 per cent. by evaporation, and the remainder by the lungs and warming excreta. But when the temperature of the air is above that of the body, conduction and radiation are no longer available as means of losing heat: they become in fact sources of heat, and the body is thrown back entirely on evaporation, which of course is less rapid the greater the percentage of moisture in

the air. This accounts for the fact that a temperature of, say, 80°F., when the air is nearly saturated with moisture, is not only more trying but is more dangerous than one of, say, 110°F., when the air is dry.

(4) Wind has been referred to as to its effect on cooling the atmosphere, particularly in the hills, but its direct effect on the human body is more important.

In a dry atmosphere the body can be subjected to great heat without a rise of temperature, owing to the free evaporation of perspiration which takes place. If, however, there is absolutely no breeze, the air round the body after a time becomes charged with moisture, and so decreases the rate of evaporation. A wind, by removing this moisture-laden air, permits evaporation to proceed unimpeded. The chilling effect of sitting in damp clothes in a draught is a common example of this.

Having thus briefly reviewed the atmospheric factors concerned, it will be well to consider which of them are met with in countries where heatstroke is common.

In Northern India, where, according to Sir L. Rogers' statistics, more than half the cases of heatstroke in the British Army have occurred, the usual hot-weather conditions are the following: A blazing sun almost directly overhead at mid-day, prolonged periods of fine, cloudless weather, dry ground and little or no wind,—all factors which tend to produce intense heat.

Coupled with this, during July and August there are storms and showers, so that the atmosphere may become charged with moisture.

It will be seen from the above that the climate differs from that of England chiefly in its high air temperature and constant bright, hot sun, accompanied at times by a high percentage of moisture in the air.

It is under these conditions that heat-diseases occur, of which the following are usually recognised.

- (1) Heatstroke.
- (2) Heat exhaustion.
- (3) Sunstroke.

(1) By 'heatstroke' is meant a condition of hyper-pyrexia, usually accompanied by loss of consciousness, and occurring in patients exposed to excessive heat, but not necessarily to the direct rays of the sun.

It is unnecessary to discuss the microbic theory of this disease, the arguments in favour of such an ætiology put forward by Sambon and Manson being founded on faulty data.

There is no doubt that it is caused by failure of the body to adapt itself to its environment. Man is constructed to be able to withstand immense dry heat for a limited time, as in a radiant heat-bath, where the temperature may rise to over 300°F. But, when the temperature

of the air is constantly above that of the body and the body temperature has to be kept normal by constant evaporation, there may come a time when the heat-regulating mechanism fails and pyrexia begins.

This is most liable to occur in men whose heat control has been upset by debility, fever, or consumption of alcohol.

It is noteworthy that heatstroke patients often remark that before the onset of the fever their skin became peculiarly dry.

Exactly how the symptoms are produced is not yet agreed upon, but some interesting experiments on the brains of animals throw light on the question. Wood found that heating the brain to 108°F. produced insensibility with, sometimes, convulsions; heating to 113°F. always caused death. Halliburton and Mott found that when the brains of cats were exposed to a temperature of 108°F. for some time, neuroglobulin separated out and a chromatolysis of the nerve-cells occurred.

A similar condition has been found in the brains of patients who have died of heatstroke.

As a temperature of 108°F. is no uncommon thing in heatstroke cases, it seems reasonable to suppose that the symptoms are due to the same morbid process. This is supported by the fact that patients whose lives have been saved from severe heatstroke often exhibit more or less dementia, showing that the brain has sustained serious organic injury.

The above refers to typical cases of heatstroke. But, as with other diseases mild or "larval" forms are observed, so also mild cases of heatstroke occur, which may present no symptoms beyond malaise, headache, and slight pyrexia, and may be followed by recovery in a few days.

Though these cases seem hardly deserving of the diagnosis of "heatstroke," which to most minds suggests a very serious condition, their mode of production certainly points to their being due to the "effects of heat" on the body.

(2) By heat exhaustion is meant a form of collapse, brought on usually by excessive exertion in a hot, moist climate, and occurring most often in weakly or alcoholic individuals.

It may be compared to the fainting fits which attack some people in a hot room. There is no pyrexia; in fact, the temperature is usually sub-normal. Just as over-dilatation of the splanchnic vessels causes an ordinary faint, so over-dilatation of the peripheral vessels may lower the blood pressure sufficiently to cause similar symptoms; particularly if the patient's heart is not strong or he has been calling on it for an unaccustomed amount of work.

(3) Sunstroke or Sun-traumatism: A large number of writers on tropical diseases classify this condition as a synonym for heatstroke,

probably from the idea that the latter disease occurs more commonly in the sun.

Others distinguish this third as a disease—sun-traumatism.

There is undoubtedly in India a very general belief that, apart from heatstroke, the direct rays of the sun are capable of causing disease by their action on the brain or spinal cord; that is to say, that symptoms other than heatstroke may follow exposure to direct sunlight.

The writer hopes that in what follows he may be able to throw some light on this question,—as to whether or no sunstroke (sun-traumatism) should be regarded as a separate entity from heatstroke, *i.e.*, whether there is such a disease as 'sun-traumatism,' and, if so, how it is produced.

It must be remembered that though the majority of cases of heatstroke occur in patients who are not in the sun, this is due to the fact that 70 per cent. of cases occur between 12 mid-day and 8 P.M., which is the hottest part of the day and is, as a rule, spent by men indoors.

But when duty demands that men should march and fight in the middle of the day, as in the Indian Mutiny or, more recently, in Mesopotamia, then cases of heatstroke are very frequent; but the fact that they occur in men exposed to the sun does not warrant a diagnosis of "sunstroke."

If, however, the sun is also able to produce disease by the direct action of its rays alone, *apart from its general heating effect*, then this disease is sunstroke, and must be produced in one of the following ways:—

(1) Action of actinic and light rays on

(a) brain or spinal cord;

(b) eyes; or

(c) body as a whole.

(2) Action of heat rays on brain or spinal cord.

It follows from this that, as far as the actinic or light rays are concerned, their effect can be produced as readily on the top of a mountain as in the plains, and irrespective of the temperature of the air.

As to the heat rays, their general effect on the body is to cause a tendency towards heatstroke. Their action on the head will be discussed later.

Since the days of Elisha and the Shunamite's child, it has been generally believed that the sun's rays have a selective action on the head or neck, but the matter needs to be studied in the light of reason and experiment, not tradition and superstition.

Before doing so it will be well to review the more important facts known about these rays.

Sunlight consists of—

Light rays, vibrating from 451–789 billion times per second.

Ultra-violet rays, vibrating at over 789 billion times per second.

Infra-red rays, vibrating at less than 451 billion times per second.

Light rays differ from the other two in being visible to the eye. These possess their qualities also in a minor degree, as light contains actinic as well as heating rays. Indeed several observers are of the opinion that some of the visible rays have more actinic effect on the body than the ultra-violet have.

For practical purposes, however, it will be convenient to classify all the sun's rays as either—

(a) Heat rays, *i.e.*, those having a purely physical effect; or

(b) actinic rays, *i.e.*, those having a chemical effect, and including possible, hitherto undiscovered, invisible rays which may have a special action on the brain.

To take the actinic rays first:

It has been shown by Widmark, Finsen and others that these rays are responsible for sun-burn.

The fact that painting the skin with Indian ink, or even tincture of iodine, prevents sun-burn is sufficient to prove that it is not caused by the heat rays.

It is natural to assume then that in countries where sun-burning is intense, the proportion of actinic rays in sunlight is large, but considering the number of daily hours of bright sunlight usually experienced in India, the pigmentation produced is not more marked than in the winter in Switzerland or during a spell of fine weather in England.

This suggests that there is little difference in the power of the actinic rays in these cold climates and in India.

Yet many men at Home repeatedly play games like tennis, cricket, and golf bare-headed in midsummer without the slightest harm, and troops spending the day in the open on manœuvres have their heads only protected by small field-service caps.

If, then, from the analogy of similar degrees of sun-burning, the *actinic rays* of the sun, except possibly at mid-day in summer, need not be feared in India any more than at Home, and so for the normal individual, tops and spine-pads are unnecessary against these rays.

As this is a somewhat heterodox view, it needs support from experiment and observation. But first consider the anatomy of the organs in question. The brain is enclosed in the skull, which is very thin in places, but this is lined by the meninges and covered by the scalp, in both of which ramify numerous blood vessels, the hæmoglobin in which absorbs actinic rays. Over all is the hair, which if abundant and dark in colour must offer a very efficient protection,

when we consider how thin a layer of dark pigment will exclude sufficient actinic rays to prevent sun-burn.

The medulla and fourth ventricle (where the heat regulating centre is generally believed to be situated) are very deeply placed inside the skull, lying as they do beneath and in front of the cerebellum and below the posterior lobes of the cerebrum.

The spinal cord also is deeply placed and protected not only by the laminae of the vertebrae, but by a quantity of connective tissue and muscle, the red colour of which might be expected to exclude actinic and light rays.

So much for the anatomy. The experimental evidence which followed—with the exception of the first to be mentioned—is all in support of the writer's hypothesis, namely, that the actinic rays in India have no selective action on the brain.

Puntoni tested the effects of the sun's rays on a piece of scalp and skull from a human cadaver and found it to be diathermanous to yellow-red and violet-ultra-violet rays. It is quite possible that a piece of scalp may react differently in the dead and in the living, but in any case this observer's evidence is somewhat discounted by his statement that "sunstroke can be contracted by exposure of the head to the sun for a few seconds," a statement which the writer can deny, as he has on more than one occasion exposed his head for over a minute to the hottest tropical sun without ill effect.

Sidney Russ, using a Simpson Arc, found that ultra-violet rays penetrated skin with great difficulty, only about one per cent. of the rays penetrating to a depth of 1.5 m.m. after eight minutes.

Finsen's experiment of preventing sun-burn by painting the skin with Indian ink also supports the view that the actinic rays have a low penetrative effect, when such a thin layer of pigment can exclude the rays from the deeper layers of the skin.

From the above experiments it is seen that ultra-violet rays have a low penetrative effect; though one observer has found that rays of the visible spectrum can penetrate the skull. If they do so, it remains to be seen if they cause harm.

Some interesting experiments have been made on animals to investigate this question.

Castellani and Chalmers found that though rabbits die in about one hour if exposed to a hot sun, this does not occur if they are protected by red glass; which suggests that their death is due to actinic rays.

The writer repeated this experiment, using, in place of rabbits, rats, which are very susceptible to the effects of the sun. He also found that red glass was a considerable protection, but he found

in addition that the red glass excluded not only actinic and light rays, but a high proportion of the heat rays, so that one is not justified in concluding that death was caused by actinic rays, particularly in the light of the following experiments.

Aron and Gibbs showed that if only the heads of rabbits were exposed to the sun, their bodies being at the same time sheltered and kept cool, no ill effects followed.

They also found that keeping the rabbits' bodies cooled by a breeze prevented them from dying though exposed to the sun.

The present writer has verified this last experiment with rats. One batch was hung up in the sun and vigorously fanned, while the controls, also in the sun, were sheltered from wind. As a rule the latter were all dead in twenty to thirty minutes, while the others, though looking very hot, were quite lively and able to enjoy a meal even after exposures of twice to four times as many minutes.

In these experiments the sun was almost directly overhead, and so was directed against the animals' spines as well as their heads. Obviously, if the lethal effect of the sun were due to actinic rays acting on the brain or spinal cord, cooling the body would have had no effect.

The inference is that the animals died of heatstroke.

#### OBSERVATIONS ON HUMAN BEINGS.

The habits and customs of the people of a country are often an indication of the precautions against the elements, which accumulated experience has taught them to observe. Perhaps the most characteristic feature of Indian apparel is the *pagri*, the thick folds of which offer a very stout protection against the sun to the greater part of the head.

It is noticeable, however, that this garment does not come low on the nape of the neck, which is only protected by the loose end or *shamla* which hangs down the back. In the winter, however,—in the Punjab, at any rate, where it is cold—the majority of the lower classes dispense with a *pagri* and wear a small, wicker skull-cap.

Kashmir is a country the valley of which stands about 5,000 feet above sea-level, and consequently enjoys an almost English climate. In midsummer, however, the sun is almost directly overhead at noon, and its rays fall with, if anything, greater intensity than in the dusty plains; yet the Kashmiri coolie never protects his head or neck with anything more substantial than a small skull-cap. No doubt his dark hair and thick skull are better calculated to withstand the sun than the head of a fair-haired European, but the balance can be made up if the latter wears a dark-coloured felt hat.



This the writer has been able to demonstrate, by not only dispensing with a solar topi in the cold weather, but wearing nothing larger than an ordinary felt hat in Gulmarg (Kashmir) during the latter half of June last year. There was a continuous spell of fine, but cool, weather at the time, and even at noon no discomfort was experienced.

If the actinic rays were capable of piercing through a soft hat and the skull, they certainly had every opportunity.

This has been the experience of numerous other British visitors to this country.

As a further test, in the month of October, during cloudless weather near Peshawar, the writer exposed his bare head to the sun from 10-30 A.M. to 12-30 P.M. on one occasion, and from 10 to 11 A.M., and 11-50 A.M. to 12-20 P.M. on another. The sun's rays were falling at an angle of  $50^\circ$  or more with the horizontal, yet in no case was any discomfort experienced beyond that caused by wrinkling the eye-lids to exclude the glare: this was relieved as readily by shading the eyes as by re-placing the topi.

It will be seen from the foregoing that there is nothing to prove that these rays are capable of penetrating the skull and acting directly on the brain or spinal cord, but there is a quantity of evidence against this view.

There is one organ of the body, however, which is undoubtedly peculiarly susceptible to light or actinic rays, and that is the eye.

The sun-blindness from which Arctic explorers suffer when exposed to the highly actinic reflection of the sun's rays off snow, is a severe example of this selective power, but pain with conjunctivitis may follow exposure to glare off sand.

These rays and the constant screwing up of the eyes and wrinkling of the brows to exclude the light, by one who is not wearing darkened glasses, are probably responsible for the majority of the headaches and uncomfortable symptoms following exposure to a sun not hot enough to be dangerous.

Certain observations point to the fact that a prolonged exposure to the actinic rays may have considerable effect on the body as a whole. Apart from sun-burning, which has been considered, these rays are probably largely responsible for the stimulating and cheering effect of sunlight, and also for the following.

It has been observed in "sun-bath" sanatoriums that if patients are exposed to the sun for a fairly long period when they first start the baths, this is sometimes followed by slight malaise and pyrexia. A similar phenomenon has been observed in the case of children at the seaside; a fine day spent without shoes and stockings on the sands being followed by a slight rise of temperature. The fact that in both

these instances the fever followed the exposure makes them comparable to the sun-burning—which does not develop at once. As such, the deduction is that the actinic rays are responsible; as they also appear to have been in the following occurrence which came under the writer's observation.

A regiment stationed at Rawalpindi went for a route-march on a bright, clear day in August, and a considerable number of the men came to hospital that evening, complaining of the same symptoms, *viz.*, headache, pains in the back of the neck, and, in some cases, slight fever. Recovery was complete in two or three days. The facts that there had been a good deal of rain the two previous days, so that the air was full of moisture (which would check the heat rays of the sun), and that the symptoms in most cases came on some hours after the march was completed, both point to their being due to actinic rays. As the men were all wearing topis which cover both head and neck, it cannot have been due to the action of the sun on these parts of the body. The symptoms must therefore have been due to the general effect of actinic rays on the body, or have been a very mild form of heatstroke. In the former case one would be justified in calling this a "Touch of the sun," *i.e.*, a mild sun-traumatism due to the action of the actinic rays on the body as a whole, and analogous to the fever observed in the sun-bathers.

In the foregoing, the writer has endeavoured to show that the actinic rays may—

- (i) produce sun-burn;
- (ii) affect the body as a whole, producing slight fever and malaise;
- (iii) affect the eyes, causing conjunctivitis or headache and malaise;

(iv) but that they have no selective action on the brain or spine, as, except in the case of fair-haired, thin-skulled individuals like young children, they either pass with difficulty through the scalp, or, if they do so, cause no injury thereby.

But no one denies that there is an undoubted quantitative, if not qualitative, difference between the sun in India and in England. This lies in the heat rays, the effect of which on the human body remains to be considered.

To summarise the practical points connected with these rays:—

(i) They comprise as a rule 76 per cent. of the total sun's rays (Langley).

(ii) More heat rays reach the earth when the sun approaches its zenith than when near the horizon, not only on account of the reduced thickness of atmosphere to be traversed, but because the intensity of a source of radiant heat varies directly as the sine of the angle which its rays form with the horizontal.

(iii) More heat passes through dry than moist air. (This fact has been verified by observations made by the writer.)

(iv) Since a proportion of the sun's heat rays are absorbed by the atmosphere, the heat so lost must be expended in raising the temperature of the latter. This suggests that heat is likely to pass more readily through hot than cold air.

From these points it is easy to see why the sun is so much hotter in India than in England. In the former country it ascends more vertically overhead, and the air is as a rule much drier and hotter.

The practical point for consideration is: Have these hot rays any special action on the human body as a whole or on particular portions of it?

There is no doubt that they can have a very marked effect on the body as a whole in tending to produce heatstroke. To take an example. Suppose the shade temperature of the air to be  $110^{\circ}\text{F}$ ., a man can only retain a normal temperature by means of vigorous evaporation. If then, he goes into the sun, roughly half his body is exposed to a much higher temperature—perhaps  $170^{\circ}\text{F}$ . or even more,—his system may be unable to cope with the extra strain and he develops heatstroke.

Knowing this, one would naturally expect that cases of heatstroke would more often occur in men exposed to the sun. Records of cases in India, however, show that this is not so, the reason being that under peace conditions during the hot part of the day, *i.e.*, late morning and afternoon, practically everyone is indoors, trying to avoid the heat, and it is at this time of day that heatstroke most often occurs. But when for military or other reasons it is necessary to be out of doors in the heat of the day, the effect of the sun is soon seen.

The history of the Indian Mutiny furnishes one of the best known instances of this.

A further example came under the writer's notice in August, 1915, when a regiment started on a 20-mile march from Peshawar at about 4 P.M. It was a very hot day and within a few miles over sixty men fell out on account of the heat, and there were three deaths from heatstroke.

Medical Officers who have served in Mesopotamia have had numerous opportunities of observing the same thing.

So much for the general effect of heat rays on the body as a whole.

The special parts of the body which have to be considered are the eyes, head, and spine.

There is no evidence that the eyes are particularly susceptible to heat rays, and as it has been shown above that they are susceptible to light or actinic rays, it is unnecessary to consider them further here.

As to the brain, Aron's and Gibb's experiments, quoted above, showed that no ill effect followed exposure of rabbits' heads to the sun, provided their bodies were kept sheltered and cool.

In the writer's experiments on rats also, both the heads and backs of the animals were exposed to the sun without ill effect, provided that the animals were kept cool at the same time. The fact that death of the controls resulted in twenty to twenty-five minutes when this precaution was not taken, gives an idea of the intensity of the heat of the sun at the time.

The above experiments show that, as far as animals are concerned, the heat rays may help to cause heatstroke, but when means of losing heat are given, they do no harm.

With regard to human beings, the observations recorded above, when considering the possible effect of actinic rays on the brain, are also applicable in this case, *viz.*, the habits of the natives of Kashmir in not protecting their heads from the sun, though its direct rays are as hot here as in the plains, and the experience of the writer and other medical men is that, provided the air is cool, the head may be adequately protected by means of a felt hat. Also the experiment of exposing the bare head to the sun.

From these it is fair to deduce that heat rays are not likely to harm the brain of a normal individual when the air is cool. Moreover, if they are unable to penetrate the comparatively thin covering of the brain, still less can they reach the spinal cord, which is everywhere deeply situated below the surface, particularly in the neck.

When the air is hot, however, it is possible that conditions may be somewhat different.

There is no doubt that the subjective sensation of the heat of the sun depends very much on the temperature of the air; in other words, on the ease or otherwise with which the body can dissipate the extra heat conveyed to it by the sun's rays.

Thus, when there is a cold wind, no discomfort may be experienced, when standing even bare-headed in the sun, while without the wind one would feel uncomfortably hot. The writer has noted the sensations produced by the sun under varying conditions, at the same time recording the actual sun temperature, taken by means of a black bulb thermometer enclosed in a vacuum.

The results show that the presence or absence of wind, and the shade temperature, are really more important from the subjective point of view than the actual solar temperature.

Few people coming from the blazing heat of the plains to a cool hill station would be inclined to admit that there is little difference between the heat of the sun's rays in the two places—yet such is the case.

Regarded from the scientific point of view there is nothing surprising in this, but an experiment carried out by the writer with a solar radiation thermometer more than proved the point, as in that case actually a higher sun temperature was recorded in the hills than at the lower elevation.

Although, as was shown by this experiment, the sun's rays may actually be hotter in the hills than in the plains, there is no doubt but that they feel hotter in the latter situation. The practical point to consider is: Can they have any more effect on the brain or cord in the plains, *i.e.*, when they are accompanied by a higher shade temperature?

It is conceivable, if the head is exposed to a hot sun for a length of time, when the high air temperature interferes with the loss of heat by conduction and radiation, and its removal by the circulation, that the sun may produce a local rise of temperature of the brain, and lead to symptoms, which, though probably in reality those of heatstroke, may be justifiably called sunstroke.

This would be particularly liable to occur in a man who remained for some time with the sun playing on a particular part of his head.

The only experiment which supports this view is that of Möller, who directed heat rays on to the heads of rabbits and produced death in some cases.

Though the deaths may have been due to general heatstroke, the post-mortem appearances showed pathological changes in the scalp and subcutaneous tissues, as much as in the brain, so that the animals apparently suffered from a local "cooking" of the head, with, not unnaturally, unpleasant results.

One other point worth mentioning in this respect is, that many natives wear a *pagri* in the hot weather, but not in the cold.

This question—as to whether the heat rays of the sun can have effect in hot air, even if none in cold air—is, however, of more academic than practical interest. As has been pointed out above, under the former conditions the sun always feels extremely hot, so that even the most confirmed sun-lover is driven to protect as much as possible of his person from the source of heat.

Assuming then that the continued application of the rays of a hot sun may be able to affect the contents of the skull, it does not, even so, seem likely that they can affect the spinal cord, which is more deeply placed.

It is true that most people object to a hot sun on their backs, but there is no evidence to show that the discomfort is due to the effect of the heat on the cord. A similar discomfort is experienced when sitting with the back to a hot fire. The writer suggests that in both cases the discomfort is due partly to auto-suggestion, and partly to the fact that the back presents the

largest unbroken surface of the body and the one least well supplied with sweat-glands, so that the body has difficulty in disposing of the heat, which may lead to distress and even symptoms of heat exhaustion—not sunstroke.

It is interesting to remark in this respect that though the Indian native wears a *pagri* in the hot weather to cover his head, he has no such special protection for his neck and spinal region.

The writer has endeavoured to show that the danger of the heat rays of the sun lies in their general effect on the body as a whole, rather than in any selective effect on the brain or cord, with this qualification, however, that when the shade temperature is above that of the body, or loss of heat is otherwise interfered with, then, under these conditions the heat rays may be able to cause morbid symptoms by their direct action on the head. But since under these conditions the sun always feels unpleasantly hot, we can deduce the following rule.

Unless the sun's rays feel uncomfortably hot, there is no need to protect the head or back from them more than any other part of the body.

Against this one often hears, even from medical men, that (a) sunstroke may occur when the sun is behind the clouds, (b) that it is necessary to wear a *topi* in a tent in the heat of the day, or that (c) sunstroke often occurs in the cold weather, when the sun strikes horizontally under the *topi*!

(a) With reference to the first of these, the fallacy lies in confusing heatstroke with sunstroke. It is in hot, cloudy weather, when radiation is at a minimum, that the hottest nights are experienced, and the attendant moisture throws the greatest strain on the heat-regulating mechanism of the body: these are the conditions favourable to heatstroke, but certainly not sunstroke.

The well-known inhibiting effects of moisture on heat rays is really sufficient to point the error of this idea, but all experiments with a solar radiation thermometer show that practically no radiant heat can pierce a cloud, and obviously the actinic and light rays are impeded by clouds.

(b) Doubtless some rays of the sun can penetrate a loosely-woven single-fly tent, but such tents are rarely used in India, and the possibility of their penetrating even a light double-fly tent seems remote.

As a test, the writer sat bare-headed in a thin double-fly 40 lb. tent from 12 to 1 P.M. on a hot day in May, the tent being exposed to the full rays of the sun. The temperature inside rose to 110°F., but no rise of body temperature occurred, nor were any ill effects experienced at the time or afterwards.

As a comparison, the thermometer was placed outside the tent but protected by a "Cawnpore" *topi*.

In 20 minutes the mercury rose to 118°F.

These facts speak for themselves.

The headache, which is sometimes complained of by men who have sat hatless in a tent on a hot day, is probably due to the general effects of heat, aided by auto-suggestion.

(c) The writer questions the diagnosis of all cases of sunstroke due to the horizontal rays of the sun in cold weather "striking under the topi."

To do this the rays must be coming very nearly horizontal and as such, in cold weather, their energy is insignificant.

As mentioned above, a very high percentage of the heat rays are absorbed by the atmosphere under these conditions.

These cases are probably fainting fits or attacks of malaria. It should be remembered that relapses of this disease occur with great frequency in the cold weather, and that the symptoms—headache and fever—are such as might lead to a diagnosis of sunstroke. This is supported by the fact, which all who have lived in India must have observed, that when a patient is inclined to be feverish, his temperature may be raised by exposure to a heat that would not affect a healthy man. He naturally regards what is merely a contributory cause, as the primary cause of his trouble, and complains of a "Touch of the sun," when a careful examination of his blood frequently reveals the malarial parasite.

#### CONCLUSIONS.

The following conclusions may be drawn from the foregoing:—

1. The actinic rays of the sun in India and in England differ, if at all, only in a slight degree; *i.e.*, in so far that in the former country they strike the earth more vertically, and the atmosphere is usually clearer.

2. They cause sunburn.

3. Sunburn is prevented by a dark skin, and the pigmentation which follows exposure to sun light is protective in nature.

4. The actinic or light rays may cause headache and pain in the eyes through penetration of these organs, particularly if they are light in colour.

In some of these cases the headache may be caused by the muscular strain produced by continuously "screwing up the eyes" to keep out glare, when the eyes are not protected from the sun by a broad-brimmed hat or dark glasses.

5. Exposure of the body to the actinic rays has primarily a stimulating effect; but if prolonged, particularly in the case of those unaccustomed to it, may produce fever and malaise.

6. Though light or ultra-violet rays may be able to pierce the dead skull, they are readily absorbed by dark pigment, and experiments on animals prove that they cannot penetrate the

living scalp. In the case of human beings also dark hair or a dark-coloured hat has been found to be adequate protection.

7. Heat rays acting on the body in hot weather predispose towards heatstroke.

8. When the air is so cool that no discomfort is felt from the sun, the heat rays have no harmful effect on the head, back or any part of the body.

9. Though exposure of the head for several minutes to an uncomfortably hot sun may have no ill effect, it is possible in hot weather, when there is difficulty in dissipating heat, that the heat rays may prejudicially affect the brain by direct action on the skull.

10. Sunstroke, *i.e.*, traumatism produced by the rays of the sun, is produced only by—

(a) Action of the actinic rays on the body as a whole.

(b) Action of actinic or light rays on the eyes.

(c) Possibly by continued action of the heat rays on the head, when the temperature of the air in the shade is high enough to prevent adequate dissipation of heat.

The pathology of this condition may be identical with that of heatstroke, though its mode of production is slightly different.

Before mentioning the precautionary measures which the above conclusions show should be taken in the tropics, it may be of interest to refer to some experiments made by the writer on the protective powers of various types of hats commonly worn in India.

Those used were the ordinary cork, white mufti topi, the thick pith Cawnpore 'tent-club' topi, and an ordinary felt hat.

The results of the experiments showed that in a given time; least heat penetrated the Cawnpore, and most heat the felt hat, the white topi coming between the two, but having little more protective power than the felt hat.

This is interesting, because the majority of Europeans in India have been brought up to believe that while they may with safety stand in a hot sun in a white topi, to do so in a felt hat is to court speedy annihilation.

It was further observed that, though the Cawnpore is the best protection, it is by no means an absolute one—in one case the solar radiation thermometer rose to 117°F. under the Cawnpore.

The writer has also observed a clinical thermometer rise from 97° to 104° F. in a few minutes inside a topi of this type which he was wearing at the time.

The practical deduction is, that no form of headgear completely excludes the heat, but that a moderate penetration of heat, up to, say, 117°F. is harmless.

## PRECAUTIONS.

From the foregoing the following precautions are advisable:—

1. In the cold weather, none are required from the heat rays.

2. The body should be protected from the actinic rays by dark-coloured underwear, or dark lining to outer garments, which should be light in colour to permit reflection.

3. Though thick, dark hair is probably sufficient protection for the head, for those not endowed with this a felt hat with a dark lining makes a suitable substitute.

In the case of young fair children, whose skulls are often practically transparent, a light but thick topi may be advisable.

4. The eyes should always be protected from direct sunlight unless of a dark colour. This may be effected by having a broad-brimmed hat.

When there is much glare from reflection, as is the case in most Indian cantonments, dark glasses are a comfort, and will probably prevent the majority of cases of sun-headache.

5. The head may be protected against moderate degrees of heat by a felt hat. This also applies when playing games like tennis, when the extra perspiration induced helps to prevent local rise of temperature of the skull.

When the heat of the sun feels intense—and this only occurs in the hot weather, when the shade temperature is high and there is no breeze—a thick Cawnpore topi should be worn.

6. During real intense hot weather, particularly when there is a high percentage of moisture in the air, there is always a risk of heatstroke.

Exposure to the noonday sun should be avoided as much as possible, but if unavoidable, clothes should be as light and loose as possible and the topi should be broad and furnished with a "cabbage-leaf" extension, which protects the shoulders.

Though an undervest, which is often regarded in India as a necessity, may help to prevent chills at sun-down, there is no question but that it limits loss of heat, and so should be avoided in the heat of the day.

7. Alcohol should be avoided before sunset. When the sun has disappeared it is customary to take a small quantity of whiskey, well-diluted. Though under these conditions it is unlikely to harm a healthy individual, it can do no good physically, and in a patient threatened with heatstroke is harmful.

As the evaporation of perspiration is the only means available for keeping the body temperature normal, when the temperature of the air is above it, free perspiration is essential. It is no uncommon thing for a man to lose eight or ten pints of fluid in this way, so that the ingestion

of considerable quantities of liquid is not a luxury but a hygienic necessity.

8. The use of spine-pads appears to be based on the assumption that sunstroke is caused by the sun striking on the spine.

The writer has been unable to find any scientific, experimental proofs in favour of this theory, and several have been adduced against it. If the spinal cord is vulnerable, it must be in the important centres situated at its origin. A well-made topi covers both the head and the back of the neck, so that a spine-pad is unnecessary, and, from the fact that it may interfere with loss of heat, may be positively dangerous, but a narrow strip of dark-coloured silk sewn inside the coat does no harm, and may give a sense of security to its wearer.

From a review of the foregoing precautions, which are not theoretical, but are based on experiment and observation, the extremely practical deduction is arrived at that, except in the case of young children, one is justified in trusting one's sensations: thus, when the sun has just risen, when it is behind a thick cloud, or when the weather is cold, no hat is necessary, but when the sun's rays are beating down with tropical fury, one instinctively seeks protection from them, and this is the time when a large, cool topi should be worn.

In other words, the Eastern sun is not, as so many people think, a strange avenging deity with totally different powers from those met with in England. It is the same beneficent source of heat and light, but owing to climatic and geographical conditions, it expends its powers in the hot weather with a liberality not experienced at Home. It is then that it becomes dangerous, but it is then also that it feels dangerous.

The writer regrets that, owing to being on field service, he is unable to give the references to the various authors quoted.

For the same reason he is not in a position to give the details of the various experiments which he has carried out and which are referred to in the foregoing.

#### EPIDEMIC OF CASES OF OEDEMA AMONGST WEST AFRICAN PORTERS.

By A. BAYLEY DE CASTRO,

Lately attached W. African F. Ambulance, Nigerian Brigade  
E. African Expeditionary Force.

THE following résumé of an epidemic amongst the West African porters, attached to the Nigerian Brigade, E. African Expeditionary Force, presents a few points of interest for which I take the liberty of offering these notes for publication.

After a tramp of over 400 miles through the bush, and across several ranges of hills, with a temperature at times humid, at others very hot



and dry, and again at times cold, with irregular hours for meals, which at times were not properly cooked, and often could not be eaten as a full meal, but rather in small quantities because for want of time; with very bad drinking water, very little rest, and a dozen other environments of a field service life, we at last arrived at camp Mukululu, across the Ruvama River, which separates the colony of late German East Africa from Portuguese East. This was in the middle of December, 1917, and here we rested for 14 days.

It was at this camp that opportunity was first afforded for studying a rather interesting epidemic of œdema cases among the porters, although I must remark that a few cases had reported with œdema of the lower extremities and anæmia during the previous week.

The principal symptomatic characteristics presented by the patients were:—

- (1) Œdema of the legs and face.
- (2) Anæmia.
- (3) Slowing of heart's action.
- (4) Occasional ascites.
- (5) Appetite normal. No pica.
- (6) Hyperidrosis.
- (7) Reflexes—(knee jerk, ankle clonus, etc.); normal in half the cases and exaggerated in the other half.
- (8) Anæsthetic and hyperæsthetic patches on legs.
- (9) Lethargy. (Very marked in one case.)
- (10) Very rapid disappearance of œdema on treatment, leaving the patient much thinner than he was before the attack.
- (11) Very rapid, all round improvement.
- (12) Rapid disappearance of anæmia on treatment.

Before proceeding further and offering any comments, I shall give the history of a few cases.

*Case 1.*—No. 867, M., "C" Coy., Nigerian Carrier Corps.

23-12-17.—Illness of 5 days' duration. Swelling of face and legs, causing an uncomfortable feeling and difficulty in walking, bowels irregular, appetite good, but after a heavy meal there is a feeling of discomfort in the abdomen.

Abdomen is distended. Right rectus muscle slightly rigid, tenderness over hepatic area, which is increased, but no definite enlargement can be detected on palpation.

Conjunctivæ anæmic—but not of the "deadly white" character.

Œdema is very marked up to knees, but also extends to middle of thigh and abdomen. No ascites:

Marked tenderness of calf muscles; and anæsthesia of anterior tibialis muscle.

Knee jerk and ankle clonus cannot be elicited, marked hyperidrosis of feet.

Heart—Slow, steady, regular. Pulse 48 per minute.

Treatment:—

Cal., grs. 2. *stat.*

Mag. sulph.,  $\frac{1}{2}$  oz., at 6 P.M.

Thymol, grs. 20 at 4-30 A.M., to be repeated in 2 hrs., if necessary.

Soamin, gr. 1., T. D. S.

Milk, and rest in bed.

24-12-17.—Anæmia reduced, but no improvement in the œdema. Patient had two 25-gr. doses of thymol this morning, and after them two doses of mag. sulph.,  $\frac{1}{2}$  oz. each, whereupon his bowels were moved, and the feces, on examination, found to contain innumerable maggots,—larvæ of *Calliphora vomitoria*.

25-12-17.—Marked improvement in œdema and general condition of patient. No larvæ of maggots found this morning. It is very noticeable that though patient has been on purgatives and milk diet, the feces are still full of particles of undigested chillies.

29-12-17.—Yesterday we shifted camp to Chulez, a distance of 8 miles, which the patient walked. No development of untoward symptoms. Patient states he feels quite fit, and he certainly looks it. No œdema, no anæmia, reflexes normal, tongue clear, appetite good, bowels regular. No maggots, hookworms, or undigested chillies in the feces. Pulse 70 per minute. Discharged to duty, at his own request.

*Case 2.*—No. 11674, M., "K." Coy., S. L. C. C.

22-12-17.—Œdema of legs. Enlarged and tender liver. Heart has a tendency to irritability, thus, when first seen, and patient had been standing, it was rapid—98 to 106 beats,—but after being in bed for half an hour, reduced to 58 per minute.

Anæmia; but not to the same degree as in other patients. Abdomen slightly distended with ascitic fluid, chief complaint is heaviness about the legs. No tenderness of calf muscles. Anæsthesia around ankle, and on instep. Knee jerk slightly increased. Appetite keen but not voracious. Urine yellow. Normal in quantity. No albumen.

Treatment.—Bed, milk, thymol, mag. sulph. and iron and arsenic tabloids 2, thrice, daily.

24-12-17.—Enlargement of liver considerably reduced, can only be felt on deep palpation, no tenderness or pain. Œdema of legs reduced considerably. Heart slow, steady, regular. Pulse 54 per minute. No ankylostoma found in feces. Calomel, grs. 2. All other treatment as before.

25-12-17.—No anæsthesia around ankle. Very faint trace of œdema, no ascites. Two 20-grain doses of thymol and two ½-ounce doses of mag. sulph. were given this morning. Large watery and scybalous stool, no ankylostoma, but several maggots, presumably larvæ of ordinary big green-fly, and a considerable amount of particles of undigested chillies.

26-12-17.—Considerable, marked improvement all round. Looks well, and says he feels quite fit. Ordinary diet.

27-12-17.—Discharged to light duty.

29-12-17.—On the 28-12-17, patient marched 8 miles.

*Case 3.*—No. 11611, K., "K." Coy., S. L. C. C.

19-12-17.—First reported sick this morning, complaining of heaviness of legs. Shins, ankles and feet œdematous. Lethargy. Conjunctivæ very anæmic, (death white) face puffy.

Treatment.—Fe. and As. tabloids, and a big dose of salts.

20-12-17.—Admitted. Bed. Tongue coated but moist, face puffy and œdematous. Marked œdema of shins, ankles and feet, extending as far as knees. No ascites. Liver enlarged to four fingers below costal margin, but not very tender or painful. Heart sounds normal, beats slow and steady. Pulse 48 per minute. Urine 1010.

No albumen. Spleen normal. Knee jerk very exaggerated. Calf muscles tender. Hyperæsthesia of shin.

*Treatment.*—Calomel, thymol, mag. sulph.; tabloids strychnine, iron and arsenic.

22-12-17. CEdema of legs practically gone. Pulse 68. Liver reduced to 2 fingers' breadth. Temperature 97°F. No ankylostoma found.

23-12-17. No cEdema of legs to-day. Knee jerk normal. Calf muscles very little tender. Heart steady. Pulse 76. Liver palpable but no tenderness. Slight puffiness of lower eyelids, rest of face normal. Anæmia of conjunctivæ reduced by more than half of what it was on the 19th. Patient states he feels well and is very hungry.

24-12-17. No cEdema. Liver normal. Reflexes normal. No tenderness of calf muscles. No hyperæsthesia of shins. Heart normal, beats 80 per minute. Fæces examined daily for hookworm, with negative results. Up. Diet. Strychnine, arsenic and iron.

26-12-17. Discharged.

The treatment adopted in all cases was:—

(1) Rest in the Hospital "Banda," on improvised bedsteads, 3 feet high. This banda, specially built for these cases, was in a dry spot and so constructed as to have at all times an abundant supply of air and sunshine.

(2) Diet, milk. This was made from "Ideal" milk and was of an excellent quality.

(3) Medicinal purgation. Thymol, iron and arsenic. One very noticeable fact was that the rest and diet brought about as good an improvement, and cure, as in the case of patient medicinally treated, though not as quickly; also cases treated out of the hospital, *viz.*, living in their lines, and attending twice daily for medicine and milk, lingered on for many days before showing any improvement; thirdly, all cases treated in hospital recovered very rapidly.

*Fæces.*—On the recommendation of Capt. Sandiman, of the West African Medical Service, and Col. Leonard, S. M. O. of the Brigade, I started an investigation for hookworm. After the evening feed (6 P.M.), the patient had nothing all night. At 4 A.M. I administered 20 to 30 or 35 grains of pulverised thymol; at 6 A.M. ½-ounce of mag. sulph. in 2 ounces of lukewarm water was given, which was to be repeated at 8 A.M. if there was no motion. The fæces were invariably of a mixed type—solid, scybalous masses and loose, yellowish-grey liquid. In nearly every case the stools for the first day or two contained maggots—larvæ calliphoria vomitoria,—which I also got on two occasions from the stools of my European hospital clerk (this man complained of itching around the anus, especially at bed-time, and he was treated for threadworms with injections (enemas) of warm salt solution), but more striking than all this was the fact that for days, in spite of constant and repeated purgation, very large quantities of particles of undigested chillies were passed.

The chilli ration for natives (Indians and Africans) was an unnecessary large amount, and often I had seen a ground-up mass, weighing at least a pound, going into the cooking pot in which the cut-up meat for four men was boiling. Here I must note that the ration consisted of beans, rice and meat, tea, sugar, salt and chillies. If fresh meat was not available "bully" was occasionally served, and often biscuits instead of rice. The beans unfortunately were not always good, and the rice was the coarse, big grain (Rangoon) variety. Rations of flour and rice often had to be condemned, owing to fermentation taking place after the sacks got wet. The porters, and this especially refers to the low type of West African men, like the Temnies and Beenies, amongst whom these cases of cEdema were more than in the Lumbwas, Mandies, and Nigerians, had the nasty, pernicious habit of just burning their meat ration outside, and keeping it like this for a day or two till sufficient time and opportunity afforded them to have a meal. The meat in the meantime being carried on the person, in the haversack, or even in the blanket. These two types of porters were also very dirty in their personal habits.

Now although I started the search for ankylostomata from about the middle of December, it was not till the 8th of January, 1918, that the first lot were found in a patient, and on the 10th January some more, in one of the ambulance stretcher-bearers, during which time some 50 cases or more had gone through the hospital, the fæces of all of whom had been examined and the epidemic was over. The method of examination was to mix up the stools to a 1 in 10 dilution with lysol solution, and strain through white as well as coloured gauze, so that neither the blood-full nor empty worm could be missed, and a very careful and systematic search was made in all stools, with the result that the worm was found in a very small number of cases, almost a proportion of 4 per cent. to 6 per cent. There were, of course, no facilities whatsoever for examining for the ova.

The anæmia was decidedly of the kind mentioned by Sir Patrick Manson in cases of hookworm, that is, none or very little lessening of the hæmoglobin, but a reduction of the R.C.'s, an hydræmia—(Bycott and Haldane).

The test was made with T. W. Tallquist's coloured paper charts.

As remarked above, the heart's action in the majority of cases was slow, only in two cases was it irregular and rapid—110 to 124 per minute, no equal spacing. The reflexes, as mentioned, were normal in half the cases, and increased in the remaining half.

Hyperidrosis was marked in all cases, especially of the feet, hands, and axillæ, and this became

very strikingly marked the moment an examination of the patient was begun, the perspiration in some cases virtually pouring off. In all the cases there was enlargement, if not tenderness, of the liver, the heart in most cases was slow, in a few irregular, and only in two, rapid and irregular, but what was a very striking point about this epidemic of œdema cases was the very rapid disappearance of all symptoms after admission to hospital, where there was better food and hygiene to the surroundings in their lines. For instance, in a little grass hut about 6 by 6 by 4, three, four or five fellows would crowd in, and at most of the camps up to Mukululu there was never any great space for spreading camp, and specially the space allotted to followers, whereas in the hospital Banda—grass house—they slept on improvised bedsteads, made of poles, sticks and grass, about 3 feet off the ground, had an abundance of air and light, were given a blanket if they did not have one, or if two were required, and were given properly-cooked food (a milk, a half, or a full diet, according as the case progressed) at regular intervals.

Again it was at camp Mukululu that the epidemic really started, although a few sporadic cases had been seen before, but when he shifted from here to Camp Chaluzi, eight miles further on, but on a height and a more open area, all the cases stopped. At Mukululu we had low bush and scrub, with open and close forest, and innumerable tsetse flies and mosquitoes, specially one very small black kind, whose bite caused considerable irritation and who attacked from 5 to 8 at night. Besides these, there were dozens of other kinds of biting flies and insects, and all these, I might remark, were in the camp as well as all over the surrounding country.

At Chaluzi the camp was free from these pests, the bush and trees had all been cleared, but the surrounding jungle was full, especially the very thick virgin bush and forest across the river, which was about a mile from camp. The causation of this disease is rather a difficult problem, seeing as it was that a certain section of porters were specially affected, and no cases at all occurred amongst the fighting troops. Again it is hard to arrive at a definite diagnosis.

The ankylostoma duodenale was only found in a few cases. The conjunctivæ were not of the typical death white, except in very few cases, who did not necessarily have hookworms in the stools. The pulse was slow and steady. (In ankylostomiasis according to Castellani and Chalmers, the pulse is quick and may be weak, thready, dicrotic, and intermittent.)

The acute, pernicious, and typical form of beri-beri can at once be excluded, while of the rudimentary, abortive or ambulatory form it is quoted that the symptoms are "so slight that perhaps the sufferer does not seek medical

advice, but in whom there may be at first increase and then diminution of the knee-jerks, patches of anæsthesia, some muscular weakness, some gastric catarrh, and general malaise.

Again, the very constant symptom noticed in all the cases was the slow pulse, and enlarged or tender liver. No jaundice.

There were no deaths amongst patients suffering from this complaint, but on the 20th of December, 1917, a Hausa soldier was admitted to hospital in a semi-conscious state, complaining of great weakness. Liver was very enlarged, and there was very intense jaundice. This man died on the 22nd December, 1917, and a post-mortem revealed an enormous but firm liver, intensely jaundiced. All the viscera and organs (heart, lungs, kidneys, etc.) and muscles were similarly stained. Spleen twice normal size, but firm; capsule non-adherent; right lung had two cystic patches.

### TREATMENT OF VESICO-VAGINAL FISTULÆ.

By IDA A. SCUDDER,

Vellore.

SOME years ago I wrote a paper on this subject. Since then I have tried various methods and used various sutures, but have come back to my original technique.

I shall attempt here to sketch briefly the salient points in the treatment of vesico-vaginal fistulæ which I have found most successful.

To most of us the entire subject is an old story. With what dismay have we examined a patient to find an ulcerated, excoriated labia; bands of dense cicatricial tissue distorting all outlines; vagina narrowed to abnormal proportions; the entire floor of the bladder gone, and oft-times the urethra torn away from the bladder or entirely missing. The patient is often dejected, hopeless, and in a very run-down condition.

Although there are various kinds of fistulæ, I shall touch only upon the technique of the large openings, with loss of tissue. I use the same methods in the simple, uncomplicated fistulæ as in the larger.

The chief factors are:—

1. The time for the operation.
2. Preparation of the patient.
3. Anæsthetic.
4. Operation.
5. After-treatment.
6. Complications.

1. *Time for the Operation.*—I prefer to operate from three to four months after the appearance of the fistula, as by that time the tissues are firm and the stitches hold more satisfactorily. Sooner than three months, the stitches are apt to

tear out more easily. Later than this, cicatricial bands are more likely to have formed. Often we have no choice as to time, but get cases years after fistula formation, in which we find dense bands and thickened cicatricial tissue.

2. *Preparation.*—The preparatory treatment is very necessary and often tedious. I prefer keeping the patient in the hospital under close observation. The patient oft-times grows tired of waiting for operation during this period, but I always regret yielding to the urgent request of the friends to hasten the operation, when I know that the conditions are not wholly satisfactory.

We must pay attention to:

(a) The general health. The patient must be built up by good diet and tonics; baths and massage are advisable.

(b) If there is any inflammation of the bladder it should be treated by urinary antiseptics. The bladder should be irrigated at least twice daily with boric or saline solution, or a very weak lysol solution.

(c) As the urine is usually highly alkaline, and incrustations of phosphates are apt to be formed, it is necessary to treat these before any operative work can be done. For this we use the following:

EMMET'S MIXTURE:

|                |     |     |        |
|----------------|-----|-----|--------|
| R Acid Benzoic | ... | ... | 3jss   |
| Sodii Borat    | ... | ... | 3ij    |
| Aque           | ... | ... | 5viiij |

*Sig:* Tablespoonful in water, three times daily. In four days reduce the dose to a teaspoonful.

Urotropine, gr.vij, b.d.

(d) All excoriations must be healed by constant bathing of the parts, drying carefully and applying antiseptic powders and vaseline.

(e) All ulcerations in the vagina and around the fistula should be treated.

3. *Anæsthetic used.*—We usually use chloroform followed by ether, but have done small fistulæ under local anæsthesia. As the severe vomiting which sometimes follows chloroform anæsthesia is a great drawback to the success of the operation, I believe that spinal anæsthesia would be the ideal in fistula cases, though I have never used it.

4. *Operation.*—The usual pre-operative treatment is given. Careful preparation is repeated after the patient is on the table. The parts are carefully cleansed and thoroughly painted with iodine.

(a) As the maximum amount of space obtainable is required for the operation, we use but one metal speculum (ball-speculum) posteriorly with lateral retractors of heavy silk. These are inserted as follows:—A large, half-curved needle threaded with a long silk suture is used; the needle enters the labia in the upper quarter, the suture is carried down deeply into the vagina and emerges at the lower angle of the labia. The suture is now drawn gently, but firmly, to one side, and should be long enough to be tied around the upright leg-support of the table. When

these *silk retractors* are once in place and securely tied, they need not be touched again. This method does away with all metal retractors held by a nurse, which are always in danger of slipping.

(b) Careful inspection of the vagina is made:

All the dense cicatricial bands should be *freely* incised, usually at the side. As these bands are of newly-formed tissue, one need not hesitate to incise freely and deeply until *all tension* is absolutely freed. No harm can be done if one uses judgment and care. We *must have space to work in*, but must avoid incising too deeply and thus interfering with the blood supply.

(c) Careful inspection of fistula and bladder is made:

If the entire floor of the bladder is missing, the ureters should be located and their position borne in mind during the next step.

(d) Thorough and extensive separation of the bladder from the vaginal mucous membrane:

An incision is made at the junction of the vagina with the bladder mucous membrane. This I usually do with a rounded blade.

The separation of the bladder now begins. I always use Kelly's curved scissors. This dissection has to be done very carefully and extensively (for fear of button-holing the bladder). At times when the bladder is adherent to the pubic bone, this seems almost impossible, but by careful, painstaking dissection it can and must be done, so as to bring the site of the fistula within easy reach. This dissection is the most trying as well as the most important part of the operation, as it requires the greatest care, the most delicate, painstaking dissection, and the utmost patience. (If one lacks patience, one had best avoid attempting a difficult fistula operation.) An assistant keeps the operative field as clean as possible by constant swabbing. If oozing is considerable and it is difficult to keep the field free from blood, we use a constant stream of sterile water over the part. An hypodermic of adrenalin is at times helpful. Unless the bladder is free at every point, failure is almost sure to result, as suturing is almost impossible if the bladder is attached to any bony surface—the site of the fistula *must be within reach*. At times it is advantageous to insert a glass catheter into the urethra and help bring the part to be dissected into closer view.

As soon as this extensive separation is complete, there should be free mobilization of the bladder. The edges of the fistula must fall together, without any tension whatever. One constantly tests the tension by placing the edges together, and should there be any tension, a further separation is necessary. When satisfied that the bladder is free and movable, the edges

of the fistula are freshened and suturing may be begun.

(e) Closure of the fistula:

The needles used for closing the opening in the bladder wall are short, thin, curved, and strong. I use a small needle-holder. The first suture is taken well beyond an angle of the opening, and should penetrate the *muscular coat only*. It is to be taken in such a way as to turn in the edges of the fistula. The needle enters a short distance from the edge of the fistula, is carried through the muscular coat and emerges *close* to the edge; it is then carried over to the other side, entering near the edge and again passing through the muscular tissue and emerging opposite the first suture. When trying these sutures it is important to see that the edges are well turned in, to bring raw surface against raw surface. There must be accurate approximation of bladder wall. I would again like to emphasize that there must be no tension. If, after the sutures are ready to be tied, one finds there is the least tension at any point, a further dissection should be done. The suture material I use is fine silkworm-gut, which after tying I cut as short as is safe. There should be no troublesome after-effects if one is careful to penetrate the muscular coat only, and never the mucous membrane of the bladder.

I have had trouble in one case only. The patient returned to the hospital some months after the operation with a small calculus which had formed on a suture which had penetrated the mucous membrane of the bladder. The calculus and suture were easily removed per urethra, and the patient had no further trouble.

I find that these silkworm-gut sutures are encapsulated and give rise to no future trouble. If the operation breaks down and the sutures are exposed to the urine, they soon become encrusted and must be removed. I have tried silk, linen, chromicized catgut, and kangaroo tendon, but have gone back to using fine silkworm-gut for the bladder sutures. As soon as all the sutures are in place they are securely, but not too tightly, tied and cut. A glass catheter is passed and sterilized milk is injected into the bladder and any leakage carefully looked for. If there should be a leak, the sutures on either side should be removed, and that portion re-sutured. This saves time and is much better than trying to close the tiny opening by suturing over it. The angles of the fistula, especially if near any bony structure, are the most difficult to close, but if the dissection has been free, the bladder movable, and the site of the fistula within easy reach (through the extensive dissection), this also will become a simple matter. A second layer of buried catgut sutures may now be put in to avoid any dead space and to cover and reinforce the bladder closure.

The vaginal mucous membrane is now sutured (with silk or silkworm-gut), trying to draw the line of incision in a different plane from that of the bladder if possible. In large fistulae with extensive loss of tissue this is sometimes impossible. In such cases I cover the opening with fascia taken from the abdominal wall. The fascia is dissected out and cut a little larger than one thinks is necessary (as it contracts slightly). It is then lifted with two pairs of forceps and placed at once over the bladder sutures. A few fixation sutures are taken, and this fascia is covered over with as much tissue as can be drawn from the sides. We have to depend upon granulation for the rest.

Our next step is to repair the incisions made in the vagina during the early part of the operation.

The vagina is now carefully cleansed, painted with iodine, and packed lightly with iodine gauze.

A rubber catheter is inserted and the milk washed out of the bladder. A long rubber tube with a connecting glass tube is attached to the catheter, and after the patient is put to bed, the end of the rubber tube is placed in a bottle hung from the edge of the bed.

I do not use a self-retaining catheter, and think it inadvisable, especially in cases where the urethra has been sutured. I sometimes steady the catheter by attaching it with adhesive plaster over the pubic bone.

5. *After-treatment*.—This I consider very important. The patient must be kept very quiet. I do not allow patients to move if it can be prevented, and I use hypodermic injections of morphia freely for three or four days if they are at all restless. The patients are not allowed to turn for six days or more.

Once daily I re-dress the case.

The patient is brought to the table and given a hot sponge-bath and oil-rub. I find this quiets and relieves patients very much, for they get tired of lying so still. I then wash the bladder thoroughly and put in a fresh, sterile catheter. A vaginal douche is given, the vagina wiped dry and dusted with boric powder. The stitches are lightly touched with iodine, and then an oleum santali dressing is placed over them and the vagina lightly packed as before. A large abdominal binder is put on, reaching below the knees.

Medicinal Treatment:

Urotropine is continued three times a day. Stimulants, if necessary. If the patient is very weak I prefer the Murphy drip method by rectum. The bladder is washed three or four times during the 24 hours with a mild boric solution. This is done by a *reliable* nurse. The catheter is not removed nor is the patient disturbed by this procedure.



We remove the catheter on the eighth or ninth day. After the catheter is removed the patient is made to void her urine (without straining) every third hour. It is sometimes necessary to pass the catheter occasionally. The stitches are removed on the tenth day. Patient is allowed to sit up on the twelfth day, and to move about on the day following. As soon as she is strong she is advised to go to her mother's home for a couple of months.

Diet consists of barley and rice congee, milk, weak coffee, and plenty of water for the first few days. I keep my patients on bland diet until the stitches are removed, when they are allowed to have usual diet.

6. *Complications.*—The most serious and discouraging complications are: (a) when the urethra, though present, is torn from the bladder at its base; and (b) when the urethra is *entirely missing*.

If the urethra is separated from the bladder at its base only, I freshen the edges and fasten it to the bladder as I am closing the fistula. The first stitch is taken posteriorly, and is often very difficult, as it is so inaccessible. I then take one or two stitches at either side, and the last or anterior stitch is included in the final fistula suture. The after-treatment in these cases is difficult, and the catheter should be most carefully and gently removed and re-inserted, or there is sure to be a leakage at this point later.

#### Absence of Urethra:

I must confess to more failures here than anywhere else, but we have had a few successes. An incision is made as far from the centre of the urethra as possible. I then dissect the mucous and submucous tissue free. A slim glass catheter is now placed in the position of the urethra and the mucous membrane is sutured over it. The ligatures must be of very fine catgut and be placed closed together. I next place an oblong piece of fascia taken from the abdominal wall, or from the leg, over these sutures, and draw over this any tissue I can dissect from the sides.

I do not operate on the fistula until after the urethra is healed, and then I do a secondary operation.

#### SUMMARY.

The points to be emphasized are:—

1. Free incision of cicatricial bands in vagina, giving the maximum amount of space to obtain free access to the fistula.
2. Free mobilization of the bladder is essential to the successful closure of the fistula.
3. Care in suturing to avoid penetrating the bladder mucous membrane.
4. Use of fascia when necessary.
5. After treatment of absolute rest.

## A NOTE ON TEETH IN THE INDIAN ARMY.

By J. F. JAMES,

CAPT., I.M.S.

THIS subject is one demanding more attention than is usually given it. I have seen large numbers of men returned from the front for reasons connected with teeth and gums, while scores of recruits are constantly rejected for the same cause.

The condition, as typically seen, consists in spongy, inflamed, easily-bleeding, and tender gums, associated with tartar deposit on the teeth, which may be loose, and pus oozing from under the gum edge.

The anæmia and indigestion resulting from toxic absorption and difficulty in mastication must greatly impair the man's efficiency.

A large percentage of men show this condition in varying degree, and the justification for this note is that the economic factor is so important, the treatment described so simple and practicable, and the results so satisfactory.

The treatments usually adopted are mouth washes and local applications with strict injunctions about cleaning the teeth.

As far as I have been able to observe, the condition starts with a series of inflammations of the gum. These inflammations are eventually followed by recession typically seen in the lower incisors. In the case of those who pay particular attention to the cleanliness of their teeth, this recession may be slowly progressive for years without other complications.

In other cases, however, men do not clean their teeth owing to tenderness of the gums or other causes.

Tartar deposits on the exposed teeth and besides keeping up the irritation to the gum forms a nidus in and around which organisms breed.

This tartar increases in the form of a wedge with the base towards the gum edge, and the gum passes into a state of chronic inflammation with acute exacerbations, gradually receding meanwhile. The teeth may be, in extreme cases, sheathed in tartar nearly to their bases, often fusing into a mass movable *en bloc*.

There is one primary and essential treatment and that is to keep the teeth from tartar.

The removal is a simple manoeuvre which can be quickly done after a little practice; nor are expensive dental instruments essential. Get a piece of steel three or four inches long and about half the diameter of a lead pencil. Any *mistri* will flatten one end, keeping the same diameter, turn it at right angles with the shaft about one-sixteenth of an inch from the end and temper it. This end may be left square, slightly rounded, or made triangular to get between the teeth.

Get this under the edge of the tartar at the gum margin, and a tug towards the biting edge of the tooth will remove a flake of tartar. Clean outside, inside, and between the teeth.

Some tartar deposits are much harder than others and a sharper instrument will have to be used. However carefully done, the gum will frequently bleed, but this does no harm. Subsequent inspection may show tartar which has been left, and this should be carefully removed. The men should be instructed to massage their gums regularly and come up for inspection every month or so.

Every recruit's teeth showing signs of tartar should be scraped as a routine measure on enlistment, and the teeth of all men occasionally inspected. These inspections are easily and quickly done. The results of tartar removal and massage, according to the majority of men treated, are that they have a better appetite, and their mouths feel more comfortable.

Locally the inflammation of the gum diminishes, and the pus, in many cases, stops.

The treatment of cases showing discharge of pus by emetin injections, vaccines, etc., I do not consider practicable, nor have I much faith in antiseptic or astringent mouth washes left in the hands of the average sepoy. Solid alum may be given out for subsequent solution by the man himself, to be used as a mouth-wash, and may assist in the amelioration of the condition. In any case, nothing approaching a cure will be achieved without preliminary tartar removal.

The term pyorrhœa I have avoided, for I do not believe that all cases with pus from under the gum margin are the pyorrhœa of the textbook. Cases do occur without a sign of tartar and floods of pus in those who clean their teeth regularly and carefully. *Such cases appear to be true pyorrhœa and are exceptional.*

As regards the practicability of tartar removal on a large scale, the Sub-Assistant Surgeon and ward orderlies can do it efficiently after a short period of instruction. It is as well to have a good class Hindu to do the teeth of Hindus and a Mussulman for Mussulmans.

#### TREATMENT OF RAT-BITE FEVER WITH INJECTIONS OF CACODYLATE OF SODA.

By ARTHUR POWELL, B.A., M.B., M.Ch., M.A.O.,

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AND

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V. B. peon, aged 29, came to P. T. Dispensary on the 15th July, 1918, with a large circular sloughing ulcer about three inches in diameter over the lower part of the left pectoralis major. The base of the ulcer was covered with yellowish

wash-leather slough with a central white islet half inch in diameter. Left arm was held close to the chest owing to the pain caused by movement of the pectoral muscles. The axillary glands were slightly enlarged. The patient said he was bitten by a rat about fifteen days before. In about four days a small red papule appeared at the site of injury. This became pustular and burst, producing a small ulcer the size of an eight-anna piece, which subsequently increased in size. He then applied quicklime as a caustic, but the ulcer spread till the 15th July, when it attained its maximum size as above described.

A purplish, macular rash, slightly raised, appeared in blotches over the body, back, arms and legs. In size the patches averaged about a four-anna piece, the most prominent being near the xiphoid cartilage, below the left costal arch, between the blades of the scapulae, back of left arm, forearm, external and back part of the thighs and calves of both legs. The patient looked exceedingly ill; complained of loss of appetite and sleep. He had fever for 10 days, from 5th day after the rat bit him. The ulcer was not painful, except on touching or on movement of the arm.

An ordinary surface smear, taken and examined by the Romanowsky method, showed septic organisms but no spirilla. On the 17th July, 1918, he was sent to Major Row, M.D., D.Sc. (Lond.), I.M.S., who kindly made a culture and inoculated a guinea-pig from the blood of one of the patches on the right thigh. The cultures have proved negative up to date, but the guinea-pig is still under observation. Major Row considered the blotchy rash as "very typical of the rat-bite fever" and suggested salvarsan be given and carbolic oil dressings be made. As the patient was unwilling to get or have a salvarsan injection, a simple dressing of the above was used till the 27th July, when it was decided to try sodium cacodylate. The first injection was given subcutaneously, the dose being 3 c.c. of a 30-grain in 50 c.c. of normal saline. This contained 1·8 grains of the salt. On the 29th July the ulcer was considerably smaller and was healing rapidly, the yellow slough and central islet having separated and disappeared, and red granulations appeared at the bottom of the ulcer, the size of which was now about 2" x 1½" in diameter. A second dose of 4 c.c. (=2·4 grains of cacodylate) of the same solution was given subcutaneously on the 29th. The third and the last injection of 3 grains of the cacodylate was given on 31st July. This seemed to accelerate the healing of the ulcer, which by the 5th August was of the size of a shilling-piece, covered with red sprouting granulations on a level with the healthy skin. The man was able to move his arm without pain, his appetite improved, and felt quite well and cheerful and was

sent to work the same day. On the 7th August, as granulations were very prominent, they were touched with copper sulphate; the ulcer was by 9th August the size of a four-anna piece. It had healed completely, and was covered over by skin on the 13th August, 1918.

In this case, sodium cacodylate had a rapid healing effect on a large wound in 10 days' time, as a result of 3 injections of 7.2 grains in all of the salt. This serves to show the value of arsenical drugs as spirillicidal as well as spirochaeticidal. This is the first time to my knowledge that sodium cacodylate alone has been used in a case of rat-bite fever. I (F. D. B.) have to thank Major Row and Dr. Powell for help and suggestions in the case.

**NOTE**—Since writing the above, the guinea-pig inoculated by Major Row, now 24.8.18, shows spirochaetes in its blood. The spirochaetes are few in number. Each is, on an average, 3 mikrons long and shows two, more rarely three loops. Both ends taper to a fine point.

The parasite is the same as that found in other cases of rat-bite fever in Bombay by Row, and differs from the much larger spirochaetes found by the Japanese pathologists.

A. POWELL.

#### Note by Dr. Powell.

I can confirm Dr. Bana's report of the very remarkable and rapid improvement following, and as far as can be judged, caused by the injection of sodium cacodylate. When the patient was sent to me in consultation by Dr. Bana for salvarsan injection, that drug and its substitutes were at a prohibitive price and scarcely procurable in Bombay, so I suggested a trial of cacodylate.

The improvement was as rapid and as complete as any I have seen from salvarsan in rat-bite fever. Its painlessness, simplicity, and economy are considerable recommendations in hospital practice.

In 1916 I had used sodium cacodylate in other cases of rat-bite fever with considerable improvement. Two doses were given on alternate days, the rash and fever subsiding. Salvarsan was given intravenously on the 5th day. He had fever of 101° F. as a result of the injection, but the rat-bite symptoms were completely removed. So in this case the credit of cure was divided between the drugs. In Dr. Bana's case no drug except cacodylate was used.

## A Mirror of Hospital Practice.

### FURTHER NOTES ON MARGOSIC ACID AND ITS SALTS AND OBSERVATIONS ON THEIR CLINICAL USE.

By KARUNA K. CHATTERJI, F.R.C.S.I.,

Surgeon, Campbell Hospital, and Teacher of Surgery, Campbell Medical School, Calcutta.

BEFORE the November meeting of the Medical Section of the Asiatic Society of Bengal, I read a paper on the use of margosic acid and its salts, illustrating it with plates and cases. This has been published in the *Indian Journal of*

*Medical Research*, Vol. V, No. 4, April, 1918. In a yet unpublished paper, illustrated with diagrams and cases, I recorded further results of my work with this drug. In the present communication I shall attempt to sum up the conclusions drawn from the cases reported below and compare them with the previously reported cases. In order to keep up a continuity some of the cases cited below have already been previously reported.

Margosic acid is a mixture of fatty acids of the oil derived from the seeds of the margosa (*nim*) tree. The salts obtained from this acid are margosates. [I may reasonably presume the medical profession is getting acquainted with these names.] Of the two soluble salts, sodium margosate and potassium margosate, I have latterly preferred to use the latter as it seems to present the following advantages:—

1. It has less hæmolytic tendency.
2. It is more soluble.
3. After intravenous injections, the same dose is less liable to cause thickening of the veins than the sodium salt.
4. It is distinctly less painful after intramuscular injection.
5. It seems to be less toxic, as proved by experimental injection into guinea-pigs.

#### SOME SEROLOGICAL OBSERVATIONS.

Margosates added to an emulsion of washed human erythrocytes cause hæmolysis. This is also noticed in the case of erythrocytes of other animals. The sodium salt has a somewhat greater hæmolytic property than the potassium salt. The hæmolytic tendency of these salts gets more and more arrested by the addition of increasing quantities of serum to the emulsion. The process adopted is as follows:—

A 1 in 20 emulsion of thrice-washed human erythrocytes was prepared. One c.c. of this was put in each of eight serological tubes. They were numbered, and serum was added; gradually increasing in quantity from No. 1 to No. 8. Last of all, to each tube was added .5 c.c. of 1 in 150 solution of potassium margosate. The result is tabulated below (Table I), also *vide* Chart I.

TABLE I.

*Note.*—Each of the following tubes contain 1 c.c. of a 5 per cent. emulsion of human erythrocytes.

| Tube No. | Quantity of serum added. | Quantity of 1 in 150 Pot. Marg. added. | Result.                   |
|----------|--------------------------|--|---------------------------|
| 1        | 0.1 c.c.                 | .5 c.c.                                | Hæmolysis.                |
| 2        | 0.2 c.c.                 | "                                      | "                         |
| 3        | 0.25 c.c.                | "                                      | "                         |
| 4        | 0.45 c.c.                | "                                      | Partial hæmolysis.        |
| 5        | 0.5 c.c.                 | "                                      | Less hæmolysis, some ppt. |
| 6        | 0.75 c.c.                | "                                      | Ppt.                      |
| 7        | 1.0 c.c.                 | "                                      | "                         |
| 8        | 1.25 c.c.                | "                                      | "                         |

It will be noticed from the above results that hæmolysis shows signs of arrest at No. 4 tube, i.e., after the addition of '45 c.c. of serum, and is completely arrested at No. 6 tube, i.e., after the addition of '75 c.c. of serum.

While going through the experiments on the hæmolytic property of the margosates, we carried out certain tests in order to see whether there was any alteration in the behaviour of syphilitic blood as compared with that of non-syphilitic blood.

The process adopted is as follows:—Two 1 in 20 emulsions of thrice-washed erythrocytes, one from a syphilitic patient, 'S.,' and the other from a non-syphilitic patient, 'N.,' were prepared. 1 c.c. from the emulsion 'S' is put in each of a series of 10 serological test-tubes, and gradually increasing doses of potassium margosate solution; 1 in 150, was added to these as shown in Table II 'S.' A similar procedure was adopted in the case of erythrocytes of the non-syphilitic patient, Table II 'N.' The results were then compared (*vide* Chart No. II).

TABLE II 'S.'

Note.—Each of the following tubes contain 1 c. c. of a 5 per cent. emulsion of thrice-washed erythrocytes from a syphilitic patient.

| Tube No. | Pot. Marg.<br>1 in 150 added. | Result.               |
|----------|-------------------------------|-----------------------|
| 1        | '01 c.c.                      | Ppt.                  |
| 2        | '02 c.c.                      | "                     |
| 3        | '03 c.c.                      | "                     |
| 4        | '04 c.c.                      | "                     |
| 5        | '05 c.c.                      | Hæmolysis commencing. |
| 6        | '06 c.c.                      | Hæmolysis.            |
| 7        | '07 c.c.                      | "                     |
| 8        | '08 c.c.                      | "                     |
| 9        | '09 c.c.                      | "                     |
| 10       | 1'0 c.c.                      | "                     |

TABLE II 'N.'

Note.—Each of the following tubes contain 1 c.c. of a 5 per cent. emulsion of thrice-washed erythrocytes from a non-syphilitic patient.

| Tube No. | Pot. Marg.<br>1 in 150 added. | Result.               |
|----------|-------------------------------|-----------------------|
| 1        | '01 c.c.                      | Ppt.                  |
| 2        | '02 c.c.                      | "                     |
| 3        | '03 c.c.                      | "                     |
| 4        | '04 c.c.                      | "                     |
| 5        | '05 c.c.                      | "                     |
| 6        | '06 c.c.                      | "                     |
| 7        | '07 c.c.                      | Hæmolysis commencing. |
| 8        | '08 c.c.                      | Hæmolysis.            |
| 9        | '09 c.c.                      | "                     |
| 10       | 1'0 c.c.                      | "                     |

In these tables, it will be noticed that whereas in the case of erythrocytes from the non-syphilitic patient hæmolysis commenced with the addition of '07 c.c. of the margosate solution (Plate II 'N'), in the case of those from the syphilitic patient it commenced with the addition of '05 c.c. of the solution (Plate II 'S'). Is there then

something in the blood of the syphilitic minus serum which is causing earlier hæmolysis as compared with the normal, as far as laboratory experiments go?

#### SOME BACTERIOLOGICAL OBSERVATIONS.

In my previous communication I came to the conclusion that the antibacterial properties of the margosates were low *in vitro*, its carboliccoefficient being only '2'. This has been confirmed by further laboratory experiments as follows:

Four tubes were taken with culture media and inoculated as follows, and incubated:—

| Culture Media.                 | Inoculation.      | Result.              |
|--------------------------------|-------------------|----------------------|
| 1. Agar broth                  | ... Staph. alb.   | ... Growth moderate. |
| 2. Agar broth                  | ... Strept. pyog. | ... " "              |
| 3. " with pot. marg. (1 in 20) | Staph. alb.       | ... " "              |
| 4. " " " " "                   | Strept. pyog.     | ... " "              |

So, the organisms grew uniformly in all four tubes. We are now carrying on experiments by making subcultures and by inoculation experiments into animals to determine any attenuation of the virus of the organisms that may have been caused by the addition of margosates to culture media.

Clinical experience has continued to strengthen my previous conclusion that the action of the margosates is strongly antibacterial *in vivo*, as can be seen by its effect in septic cases cited below.

With reference to the antiprotozoal properties of the drug, experiments with the flagellate *proteus* have been repeated and our former conclusion further strengthened. Clinically, their action in cases of spirochætal infection by removing its manifestations is further corroborated by cases reported below. In some cases their influence on Wassermann reaction has been quite encouraging.

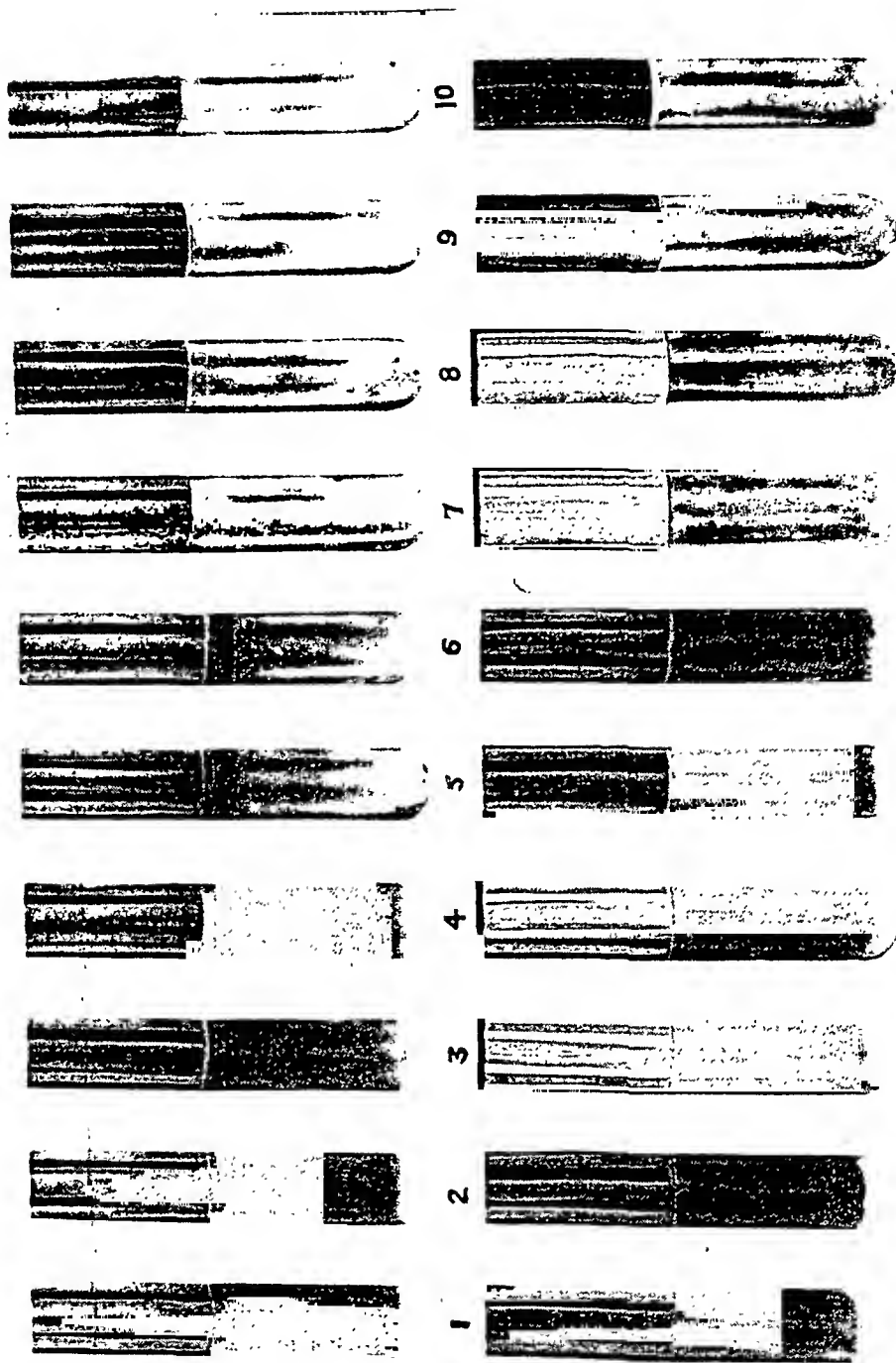
Experiments with fungi have led us to the same conclusion as that with cocci. Whereas, it does not arrest the growth of the common tropical fungi, *Mucor mucedo*, in culture tubes, clinically it has a definite curative effect in cases of ringworm (*trichophyton megalosporon*) and pityriasis versicolor (*microsporon furfur*). In the case of *sarcoptes scabiei*, margosic acid and margosates have distant anti-parasitic properties.

#### CLINICAL OBSERVATION.

*In syphilis.*—The margosates have proved more effective in removing tertiary lesions of syphilis. They also clear up primary and secondary manifestations, but the process is slower. In all cases the general condition of the patient has much improved (*vide* cases Nos. 1 to 43).

*In skin diseases.*—In several forms of skin disease due to single or mixed infection, the drug has been proved to possess curative

PLATE II.



S

N



*Surgeon, Campbell Hospital, and Teacher of Surgery, Campbell Medical School, Calcutta.*

CHART No. I.—Mrs. H., 16. Case No. 60. Puerperal septicæmia

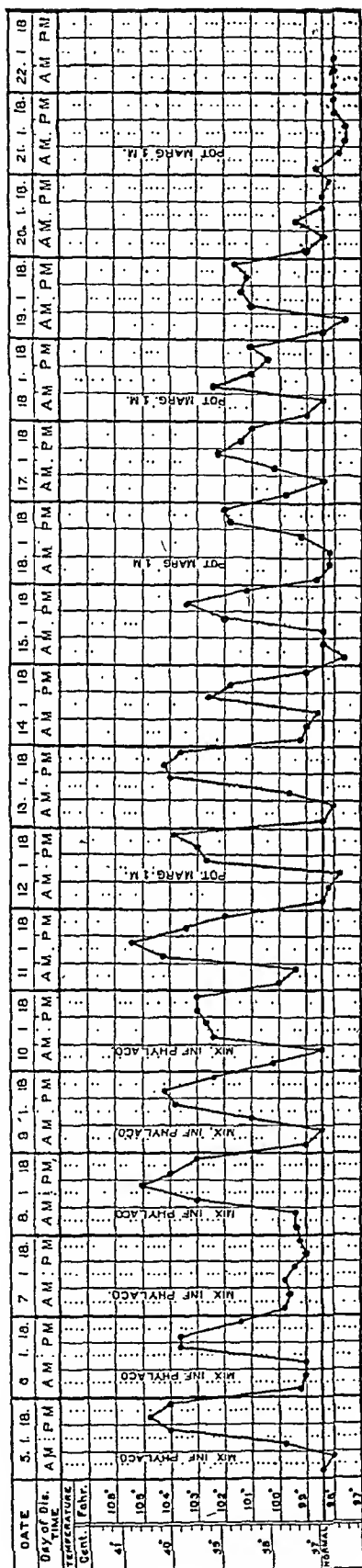


CHART No. II.—K. B., M. M., 15. Case No. 61. Suppurative parotitis.

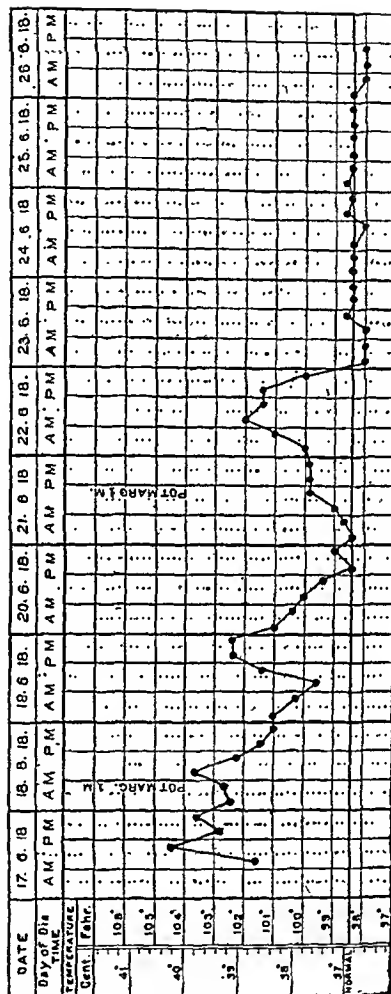
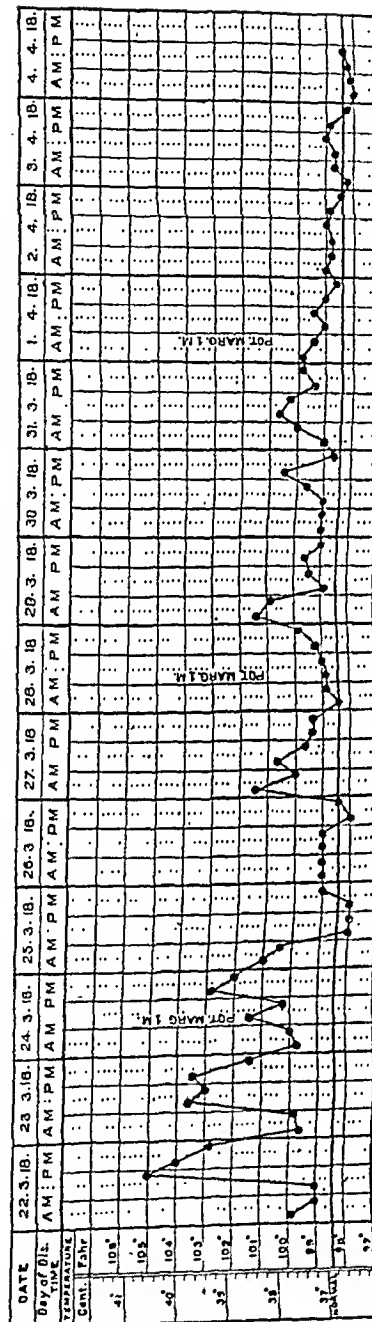


CHART No. III.—Mrs A. I Ch F, 20 Case No 63. Suppurative mastitis



properties, e.g., in scabies-pustular or scaly; in eczema, psoriasis, etc. (*vide* cases Nos. 44 to 57).

*In septic cases.*—In cases of acute and chronic sepsis due to the ordinary pyogenic (staphylococci, streptococci, etc.), or specific organisms (tubercle bacilli), or mixed infection, injection of margosates and local application of the acid and salts have improved the local condition and reduced the temperature. Along with this, the constitutional symptoms due to toxæmia have also improved. In superficial ulcers, cellulitis, erysipelas, parotitis, chronic sinuses, necrosis of bone, etc., the healing properties of the drug have been found to be remarkable (*vide* cases Nos. 58 to 65 and Charts No. I, II, III).

#### CONCLUSION.

In margosic acid and its salts the medical profession will find a powerful therapeutic agent which can be used in combating infections of diverse nature. We have tried to ascertain its specific action in syphilis. In the cases reported it will be seen that the manifestations of the disease have cleared up readily. Regarding Wassermann reaction, it has been rendered negative in one case and it has remained so after a dose of provocative injection of galyl (*vide* case No. 13). In three other cases the Wassermann reaction has been considerably reduced (*vide* cases Nos. 20, 25 and 37). The effect seems to be more pronounced in tertiary lesions. This may be due to the fact that the margosates act best when there is a mixed infection of the spirochaetes with some pyogenic organisms.

In skin diseases, small doses of injection and local application have cured acute and chronic conditions and the interesting part of this treatment is that there has been no recurrence for a long time after the suspension of treatment, e.g., Case xxvii M. D. reported in the *Indian Journal of Medical Research*, Vol. V, No. 4.

In the following series of cases many are still under observation and at the time of this paper going to the press there are no signs of recurrence.

#### CASES OF PRIMARY AND SECONDARY SYPHILIS.

CASE 1.—M., H. M., 21. Chancre and papular syphilides. W. R., v. s. p. Nine inj.s.: all signs disappeared after eight.

CASE 2.—S. C., H. M., 32. Diffuse roseola and macules for one month. Chancre on dorsum of penis. Cephalalgia, sore throat and joint pains with fever. Five inj.s.: reported six weeks later by doctor that patient was 'cured'.

CASE 3.—Mrs. B., H. F., 30. Patches of psoriasis, onychia, frontal headache for two months. Had repeated abortions. Prolonged mercurial and arsenic treatment had no effect. Five inj.s.: local application of acid solutions. Psoriasis disappeared and onychia improved.

CASE 4.—Im., M. F., 25. Macules and papules. W. R., v. s. p. Eruptions almost disappeared after two inj.s.

CASE 5.—S. P., H. M., 35. Sloughing ulcer foot, penis and scrotum. Papular syphilide. W. R., s. p., eruptions became dry and ulcers began to improve and eventually healed up after ten inj.s.

CASE 6.—L. M. C., H. M., 32. Ulcer scrotum and penis. W. R., v. s. p. Ten inj.s. Ulcer was healing, but a few ecthymatous patches appeared after third inj., but disappeared after tenth.

CASE 7.—A. G., H. M., 32. Erosive ulcer glans penis; papular syphilides. Inguinal bubo and sinus. Fourteen inj.s. Eruptions, bubo and sinus healed up early. Erosive ulcer epithelialized after tenth inj.

CASE 8.—R. A., H. M., 32. Diffuse pustular syphilides. W. R., s. p. Four inj.s. Eruptions disappeared after third.

CASE 9.—N. C., H. M., 28. Phagedenic ulcer with partial destruction of penis; palmar psoriasis. Ten inj.s. Psoriasis disappeared after fourth. Ulcer epithelialized after eighth. W. R. on 1-2-18, moderately positive, and on 15-4-18, moderate.

CASE 10.—C. L. R., H. M., 32. Ulcer scrotum and inguinal regions. Extensive psoriasis all over the body. Had two inj.s. of novo-arsenobenzol several weeks before admission without any improvement. W. R., doubtful. Six inj.s. and local application of margosate ointment. The psoriasis cleared up rapidly after third inj., and ulcer healed after sixth. (*Vide* Plates III and IV.)

CASE 11.—R. S., i. ch. m., 18. Phimosis with concealed erosive chancre. W. R., moderately positive. Hardness less and ulcer cleared up after four inj.s.

CASE 12.—M. P., H. M., 28. Chancre and spreading inguinal ulcer. W. R., v. s. p. Chancre healed up after 8 and ulcer after 12 injections.

CASE 13.—K., H. M., 33. Irregular spreading unhealthy ulcer, scrotum. Had two inj.s., as out-patient. (*Vide* case 11, *Indian Journal of Medical Research*, April 1918.) After three inj.s., eruptions disappeared. W. R., v. s. p. After six, ulcer healthy, healing. W. R., very slightly positive. After nine, ulcer epithelializing. W. R., absolutely negative. After twelve, ulcer healed. W. R., after 'provocative' inj. of galyl absolutely negative.

CASE 14.—P. C. M., H. M., 24. Phimosis and chancre. Ecthymatous syphilide. W. R., v. s. p. 12 inj.s. Healed up after ten.

CASE 15.—T. P., H. M., 30. Chancre and sinus after bubo. W. R., slightly p. Healed up after four inj.s.

CASE 16.—G. C. B., H. M., 30. Ulcerated chancre inside phimosis, papules and macules. W. R., v. s. p. After fifth inj., ulcers healing and eruptions improved. After eighth, all healed up.

CASE 17.—S. C. P., H. M., 25. Chancre and papular syphilide, mucous patches fauces. No improvement with mercury. W. R., s. p. Ulcer healed up and all cleared after five inj.s.

CASE 18.—X., H. M., 22. Phagedena penis, ecthymatous syphilide. W. R., s. p. Ecthyma disappeared, ulcer granulating after six inj.s.

CASE 19.—D., H. M., 41. Papular and macular syphilides. W. R., v. s. p. Eruptions disappeared after six inj.s.

CASE 20.—N. G., H. M., 25. Chancre and pustular syphilide. Chancre healed and eruptions disappeared after four inj.s. W. R., before treatment v. s. p., after treatment moderately p.

CASE 21.—S., H. M., 31. Perianal condylomata ulcerated. W. R., neg. Healed after four inj.s.

CASE 22.—Dr. B., H. M., 27. Recurrent chancre. After two inj.s. of novo-arsenobenzol with W. R. p. Four inj.s, ulcer healed up.

## CASES OF SYPHILIS—TERTIARY STAGE.

CASE 23.—J. M., F., 25. Painful gummatous ulcer leg. W. R., m. p. Pain and discharge ceased and ulcer granulating after four injs.

CASE 24.—B., M. F., 50. Similar case to 23, with same result.

CASE 25.—A., M. M., 30. Gumma pharynx, dysphagia. Cleared up after seven injs. and local applications. W. R., before treatment v. s. p., after treatment s. p.

CASE 26.—J. N. R., H. M., 28. Nodes on legs and forearms with much nocturnal pain. W. R., v. s. p. After eleven injs. and inunction with margosate ointment, pain and swellings disappeared.

CASE 27.—R. D., H. M., 22. Gummatous ulcer leg for 18 months. Healed up after nine injs.

CASE 28.—S., M. M., 26. Similar case as above W. R., v. s. p. Cleared up after four injs.

CASE 29.—B. C. P., Parasyphilis (*vide* case No. 26, *Indian Research Journal*, p. 672). W. R., is now moderately p.

CASE 30.—H. D., H. M., 26. Gummatous ulcer penis. W. R., v. s. p. Healed up after four injs.

CASE 31.—S., H. F., 42. Gumma palate with wash leather slough. After five injs., slough separated and ulcer healed.

CASE 32.—N. S., H. M., 30. Necrosis femur with deep sinus for two years. W. R., v. s. p. Five injs. and sinus filled up with margosic acid solution; healed up.

CASE 33.—Mrs. R., H. M., 32. Suppurating gumma, nose, which had burst. After 8 injs., it healed up.

CASE 34.—T., M. M., 60. Gummatous ulcer with a deep sinus thigh. W. R., s. p. Three injs. and sinus filled up with margosic solution, ulcer healed and sinus closed.

CASE 35.—P. M., M. M., 30. Large sloughing gummatous ulcer leg for 6 months. W. R., v. s. p. Seven injs., and margosic solution dressing. Healed up. (*Vide* Plate VI.)

CASE 36.—G. H., H. M., 28. Similar ulcer as above but on both legs. W. R., v. s. p. Healed up after 6 injs.

CASE 37.—I. S., M. M., 45. Similar ulcer as above on foot. Much inflammation. Healed up after five injs. W. R., before treatment very strongly p., after treatment slightly p.

CASE 38.—Mrs. C., H. F., 52. Multiple nodes, deep sinus right leg, severe nocturnal pains. Seven injs., and sinus filled up with margosic solution. Pains ceased after third inj., and all nodes disappeared after sixth.

## CASES OF HEREDO-SYPHILIS.

CASE 39.—J. M., Ch., 5. Saddle-nose onychia and paronychia, anal condylomata. W. R., moderately p. After three injs. and local application of margosic ointment, all healed up.

CASE 40.—D., H. M., 24. Squamous syphilides gluteal region and chest wall. After seven injs., doctor reported all disappeared and 'cured.'

CASE 41.—G. C. P., H. M., 19. Breaking down gumma and extensive nodes arm and forearm determined by skiagram. W. R., v. s. p. After four injs., ulcer healed up, after eight, nodes disappeared (seen in skiagram).

CASE 42.—H., H. M., 17. Anal condylomata and radiating scars month. W. R., v. s. p. After five injs., all cleared up.

CASE 43.—R. B. S., H. M., 12. Periostitis necrosis both tibiae, sinuses and ulcers. Ulcer healed, periostitis and pain subsided after seven injs.

## CASES OF SKIN DISEASE.

CASE 44.—I. B., E. F., 13. Pustular and scaly eczema with crusts. Sir Leonard Rogers' examination report: 'purely local due to pustules and boils: staphylococcal.' Six injs., and local application of margosate ointment, completely cured.

CASE 45.—S. B. (sister of case 44): similar case, and same result.

CASE 46.—G., E. F., 15. Diffuse pustular eczema, staphylococcal, sulphur and mercurial ointment, no effect. Same treatment as above. Cured.

CASE 47.—Sybil, N. Ch., F., 7. Scabies distributed all over the body, similar to case No. 27, *Indian Research Journal*. Cured after two injs., and local applications.

CASE 48.—N. P., E. F., 15. Recurrent eczema foot, much irritation very persistent. Staph. alb., isolated from scales and pus. All subsided after three injs., and local application.

CASE 49.—J. C., E. F., Ch., 7. Scabies hands, legs and trunk, irritating ichorous discharge, staphylococcal. Six injs., and local application, cured.

CASE 50.—V. M., E. F. Ch., 12. Papular and scaly eczema, some pustules all over body, very irritable. After three injs., all cleared but scales on palm. These cleared up after the sixth.

CASE 51.—M. K., E. F., Ch., 5. Pustular and vesicular eczematous patches all over the body. Six injs., margosate ointment and zinc-margosate dusting powder, all healed up.

CASE 52.—O. H., E. F., Ch., 12. Vesicular and pustular eruptions chiefly on palmar and plantar aspects and inter-digital spaces. Disappeared after sulphur externally and internally, but recurred badly. Five injs., and margosate ointment, cured her.

CASE 53.—M. S., E. F., Ch., 7. Crusted scabies, hands and feet, three injections and local margosic application, cured.

CASE 54.—V. K., E. F., Ch. Psoriasis with desquamation. After two injs., and local application of zinc margosate, the parts became smooth and clean.

CASE 55.—E. K., E. F., Ch., 11. Crusted eczema gluteal region. Three injs., and margosic ointment locally, all cleared up.

CASE 56.—W. H., E. F., 13. Acneiform and pustular eruptions, sero-purulent discharge. Five injs., rendered the skin smooth.

CASE 57.—E. G., E. F., 11. Vesicular eczema both cheeks and gluteal region—staphylococcal, four injs., and zinc margosate ointment: inflammation subsided and the part became clean.

## OTHER CASES—SEPSIS, ETC.

CASE 58.—B., H. F., 40. Facial erysipelas, streptococcal, much cedema and inflammation. Patient very low. Two injs., and application of margosic solution. Cured in 9 days.

CASE 59.—K. N. C., H. M., 32. Extensive cellulitis left foot and leg. Symptoms of acute sapraemia, five injs., and margosic solution dressing. Complete cure within three weeks.

CASE 60.—Mrs H. Jewess, 16. Puerperal septicaemia and cutaneous erysipelas extending over perineum, gluteal region, abdomen and thigh. Foul vaginal discharge. Streptococci detected in punctured fluid. Mixed injection phylacogen had no effect. Four injs., and painting the part with margosic solution, arrested extension, reduced temperature and stopped discharge. (*Vide* Chart I.)

CASE 61.—K. B., M. M., 15. Suppurative parotitis and cellulitis face, left side. Much sloughing and cedema, sapraemic symptoms, two injs. brought down temperature. Ulcer healed. (*Vide* Chart II.)

## Abbreviations:

W. R.—Wassermann reaction.

M. P.—Moderately positive.

P.—Positive.

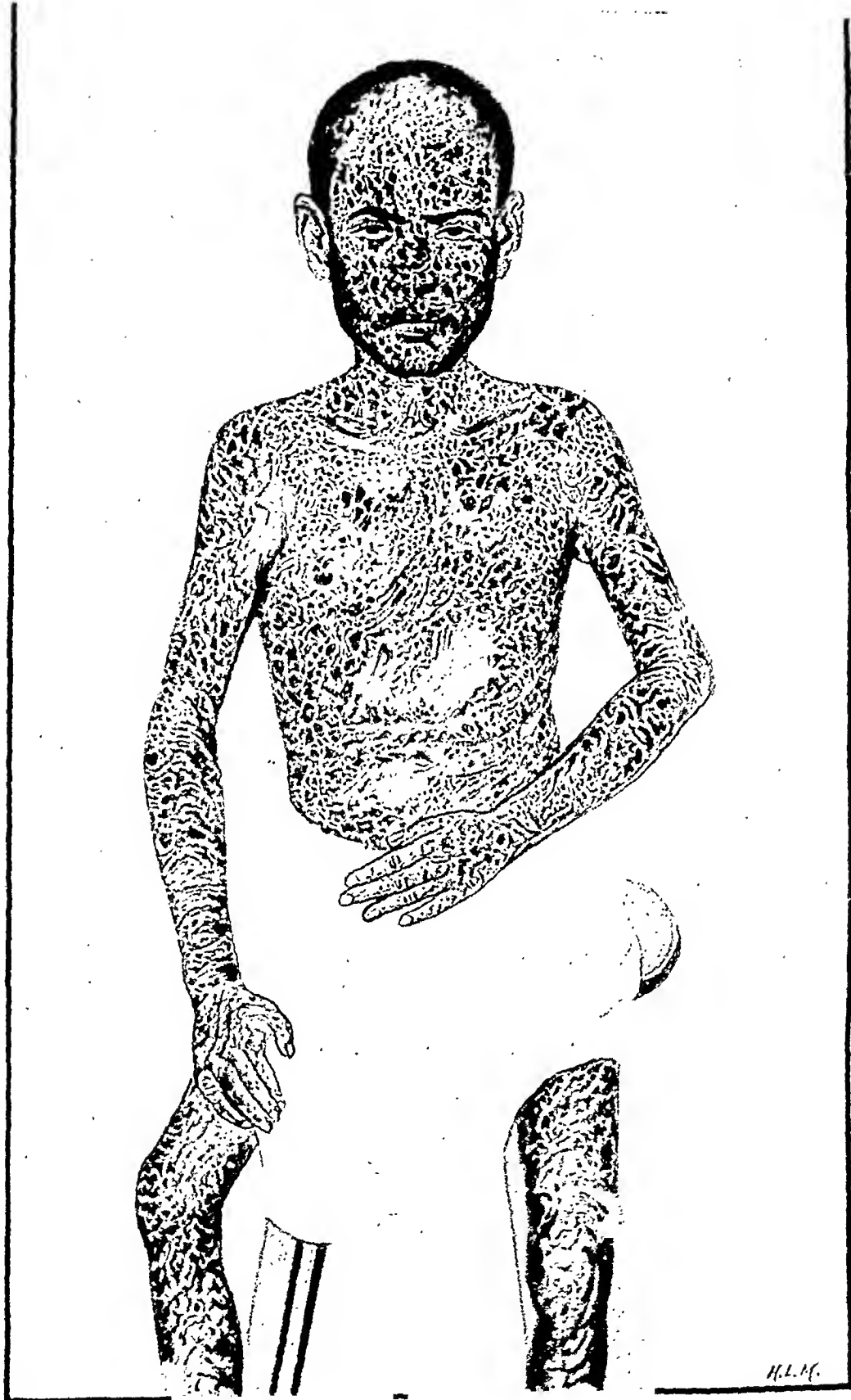
S. P.—Strongly positive.

V. S. P.—Very strongly positive.

Inj.—Injection of potassium margosate solution, intravenously.



PLATE III.

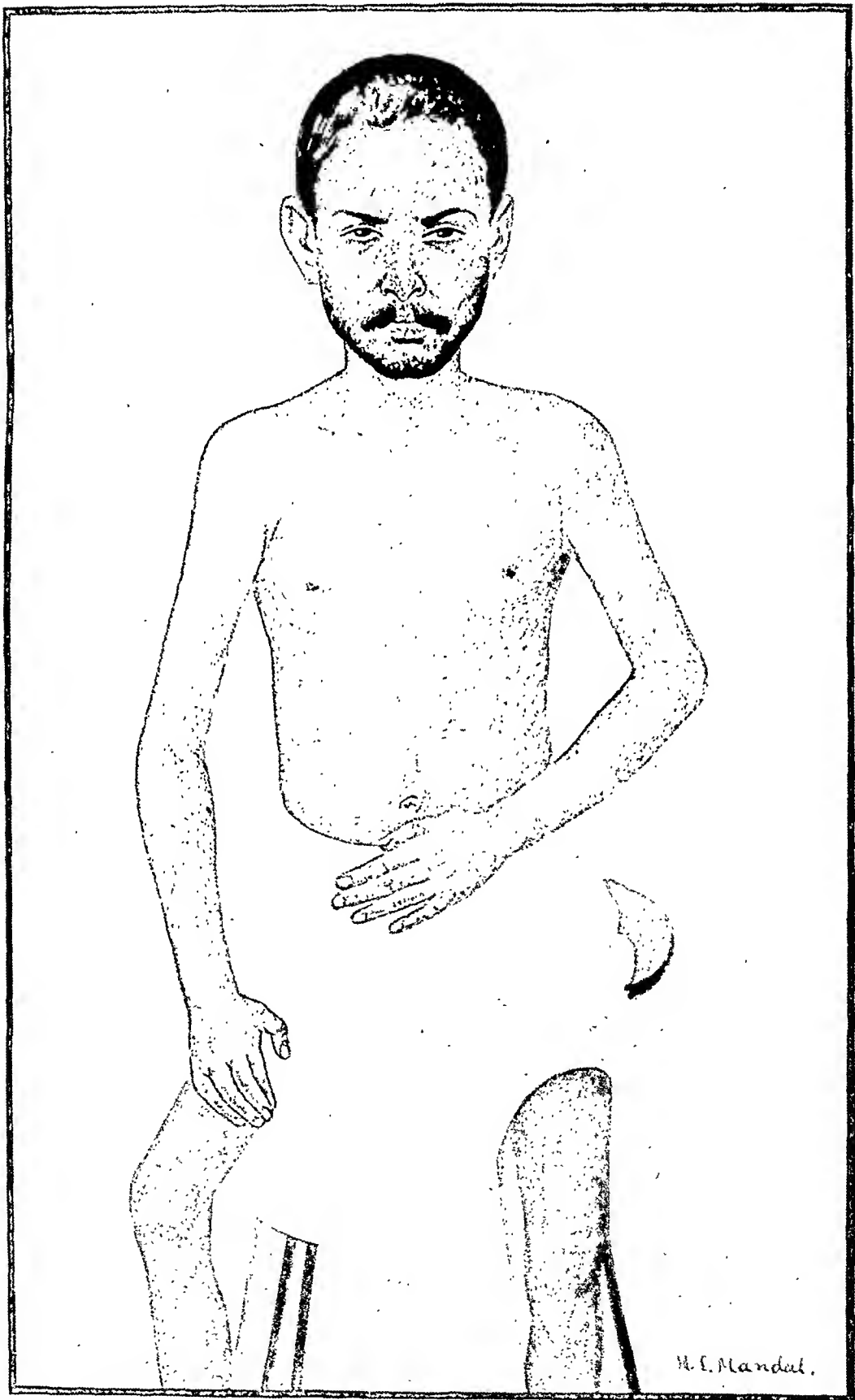


H.L.M.

BEFORE TREATMENT.



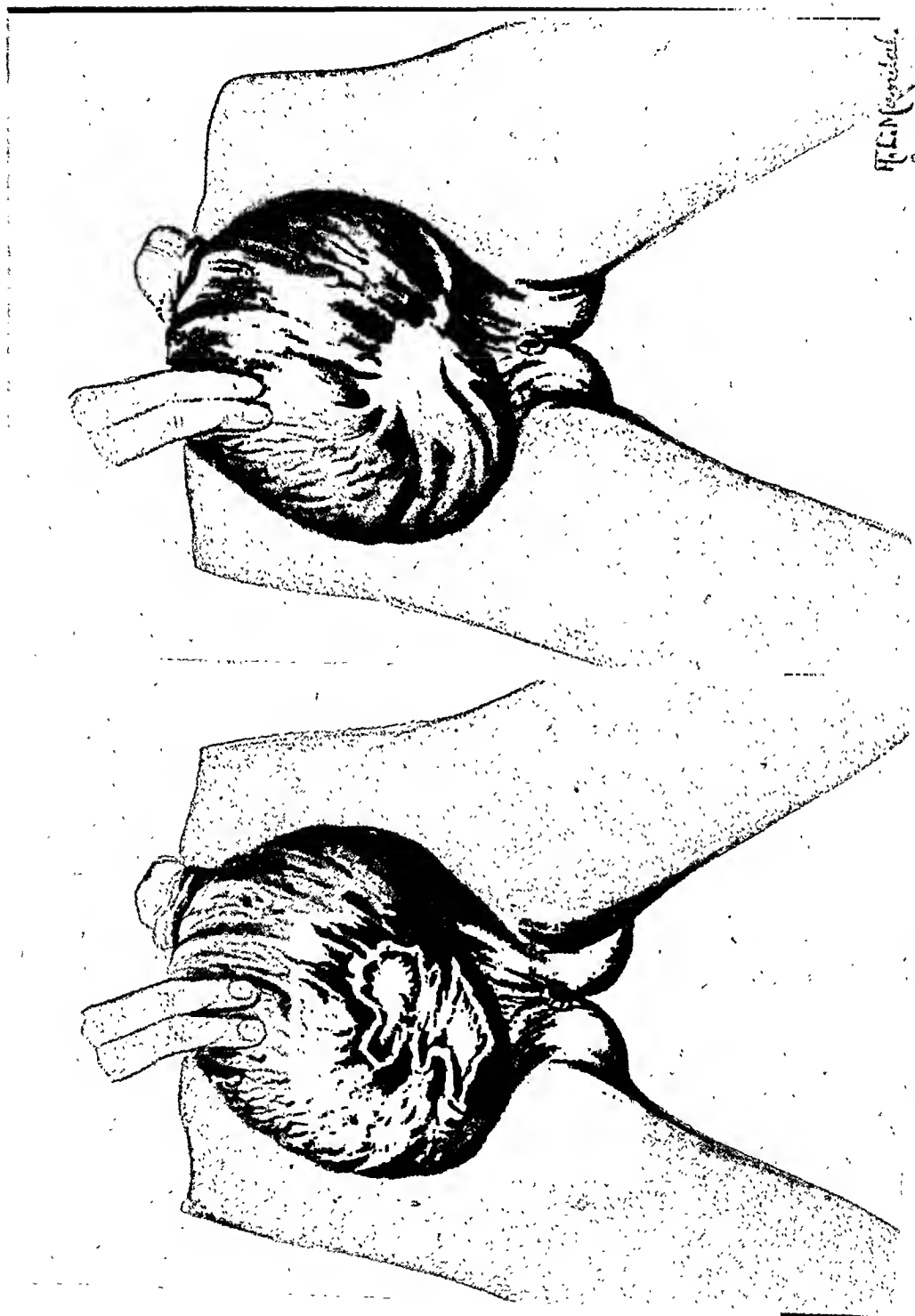
PLATE IV.



AFTER TREATMENT.



PLATE V.

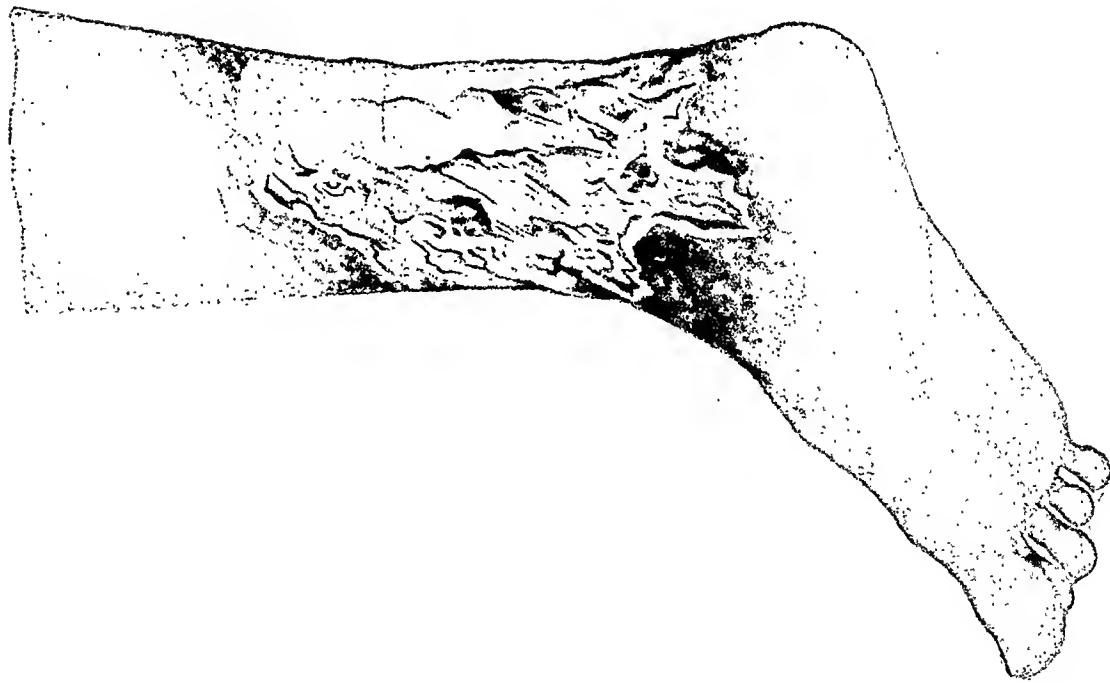


BEFORE TREATMENT.

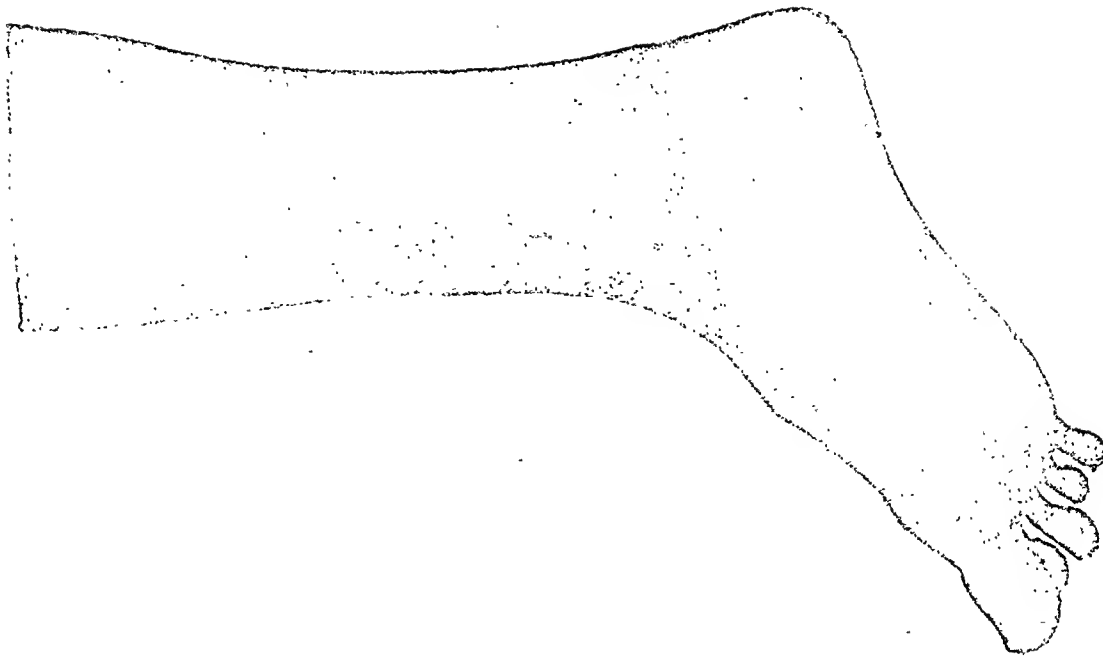
AFTER TREATMENT.



PLATE VI.



BEFORE TREATMENT.



AFTER TREATMENT.





**Antipyrin, Phenacetin, and Pyramidon  
superseded.**

## CRYOGENINE

LUMIÈRE.

**NON-TOXIC : EFFICACIOUS : HARMLESS**

Adopted by the French Ministries for War and the Navy, also by the Poor Relief Board. Papers on "Cryogenine" have been read before various Medical Societies by over 90 of the most eminent Continental Medical Men. In each paper clinical results of the most satisfactory character are recorded. "Cryogenine" is a white crystalline powder, odourless and almost tasteless; its chemical composition is Metabenzamido semi-carbazide.

Cryogenine has a high reputation as a

**GENERAL ANTIPYRETIC and POWERFUL ANALGESIC.**

FORMS.—Tablets, Pills and Powder.

LANCET, Dec. 18th, 1909, p. 1812: "..... The above case is one out of a number of successful results obtained from the use of this remedy (Cryogenine) contrasted with Pyramidon, which certain writers regard as the best drug for phthisical temperature. I think there can be little doubt 'Cryogenine' is the safer and more efficacious antipyretic, ....."

J. E. G——, M.D.

**BURNS**

**VARICOSE**

**ULCERS**

**RHEUMATISM**

**NEURITIS**

## AMBRINE

(The only Authorised Preparation of Dr. Barthe de Sandfort.  
Various Imitations compel us to make this statement.)

**GOUT.**

**NEURALGIA**

**CHILBLAINS**

**SCIATICA**

**AMBRINE instantly alleviates pain, promotes rapid healing, forms a sure Protection against Infection of the Wound.**

Although the dressing with AMBRINE is occlusive and adhesive, it becomes after a short period non-adhesive, and can be removed without pain, hæmorrhage, or injury to the newly forming tissues. The healing takes place without leaving scars or contraction.

May be applied with a camel's-hair brush, but our specially designed spray greatly facilitates the application.

**THE BRITISH MEDICAL  
JOURNAL,**

Sept. 2nd, 1916:—

*Re AMBRINE TREATMENT.*

"..... The primary and quite incontestable advantages of the treatment are two: it is agreeable to the patient, because entirely painless; it is convenient to the surgeon, because easily and quickly applied. .... It is possible that the treatment would be useful in dealing with ordinary ulcers, and in any case it is certain that the study of its application to the raw surfaces is worth pursuing. ...."

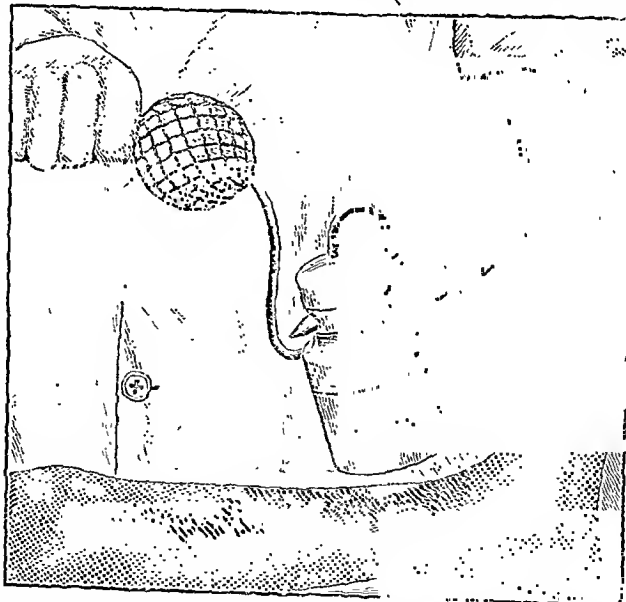
26/10/17.

E——.

DEAR SIR,—I thank you for the Ambrine. I found it very effective in a chronic and very painful varicose ulceration of leg.

Please send some more Ambrine, about 5s. worth.

A.G.W., M.R.C.S., L.R.C.P., &c.



**THE LANCET,  
June 10th, 1916:—**

**THE VALUE OF AMBRINE  
IN THE  
TREATMENT OF WOUNDS.**

"Attention is being drawn to the remarkable success of the Ambrine Wax treatment now being used at the Hôpital St. Nicolas at Issy-les-Moulineaux for burns, frozen feet, and all wounds where the tissues have been so damaged as to exact great length of time and considerable disfigurement in their restitution by the usual means. The Minister of War, in reply to the Deputy M. Monsas as to why, in view of the marvellous results obtained by treating burns and frost bites with Ambrine at the Hôpital St. Nicolas, all the soldiers suffering from such wounds were not sent there, stated that this was being done as far as possible. ...."

The most efficient means and method of ensuring active **Hyperthermal-Therapy** to the practical treatment of **Burns and Varicose Ulcer, Rheumatism, Gout, Arthritis, Neuralgia**, and similar affections.

*LITERATURE and CLINICAL REPORTS on REQUEST.*

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'Phone: HOLBORN, 1311.

## Recurrent Fever SYPHILIS

# GALYL

Frambæsia and  
Sleeping Sickness

Practical work with GALYL in the shape of

**60,000 INTRAVENOUS** (Dilute and Concentrated) and **INTRAMUSCULAR INJECTIONS** administered in Military, Naval and the principal General Hospitals throughout the United Kingdom, has demonstrated that this preparation is **more rapid and less toxic** in action than any compound of the "606" group, which accounts for the **consistently excellent clinical results without any undesirable by-effects.**

### Forms:

.....FOR INTRAVENOUS INJECTIONS:—

(1) **DILUTE.**—GALYL is supplied in neutral glass ampoules containing the necessary dose of Sodium Carbonate, sterile distilled water only being used for the dissolution.

(2) **CONCENTRATED.**—A special outfit containing one dose GALYL, one ampoule sterilised solution, and one small filter is supplied.

#### Doses:

0.10—0.15—0.20—0.25—0.30—0.35—0.40

(3) **FOR INTRAMUSCULAR INJECTIONS:—**  
GALYL is supplied in **OILY EMULSION.**

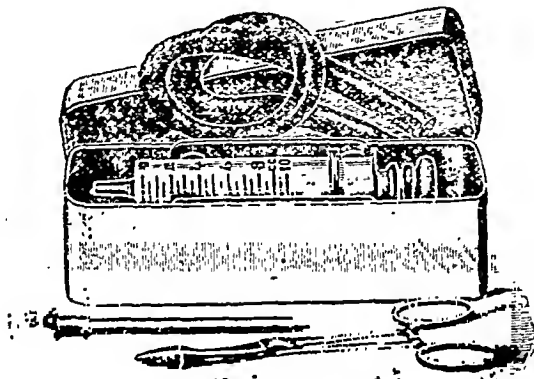
#### Doses:

0.10—0.15—0.20—0.30—0.40.

## POCKET CASE.

Containing the entire instruments (sterilizable) necessary for administering a concentrated intravenous injection of GALYL or other solution.

- 1 India-rubber Tube for constricting the arm.
- 1 Clamp for fixing the rubber band.
- 1 Glass Syringe of 10 c.c. capacity.



- 1 Platinum-iridium Needle length 4 cm., diameter 0.9, with short bevelled joint and special barrel. Attachable to the syringe without any additional junction.
- 1 Nickel-plated Case to hold all the above.
- 1 Chamois Leather Pouch.
- 1 Glass Filtering Tube, with rubber attachment.

Price complete 30/

## HECTINE

**Formula:** Sodil Benzo-sulpho-p-amnia-phenyl arsonas.

Dr. Mouneyrat—the discoverer of Galyl (the well-known and widely adopted French Neo-Salvarsan substitute) and also Hectine, a compound which—though it possesses a very low arsenic percentage and has proved most safe in use—gives remarkably successful clinical results in syphilis and the parasyphilitic affections. Hectine has a record of about one million injections.

Hectine is not only a specific in syphilis, but it acts as a general tonic in the treatment of bloodless and anæmic patients and in all cases where **Arsenic** is indicated.

In malaria it acts as a specific owing to its anti-parasitoid and anti-thermic actions; also in tuberculosis, rachitism, neurasthenia, asthma, chorea, skin diseases, etc., etc.

**Hectine** is supplied in hermetically sealed ampoules for intramuscular injections.

Ampoules A—containing 10 c.g. in 1 c.c.

Ampoules B—containing 20 c.g. in 1 c.c.

Pills (in phials of 24) 10 c.g.

## HECTARGYRE

(Mercurial Salt of Hectine)

Hectargyre being a **double specific** cures syphilis and all its manifestations more rapidly and more surely than any other mercurial preparation.

As a treatment following Galyl, or *ab initio* in all stages of the disease, Hectargyre is very effective and rapid; it is well tolerated even where prolonged treatment is necessary; the most intractable cases of syphilis have yielded highly satisfactory results.

Hectargyre is supplied in sterile ampoules for intramuscular injections.

Ampoules A containing—

Hectine 10 c.g. }  
Hg. 1 c.g. } in 1 c.c.

Ampoules B containing—

Hectine 20 c.g. }  
Hg. 1½ c.g. } in 1 c.c.

Pills containing—

Hectine 10 c.g.  
Protoid of Hg. 1 c.g.  
Opium Extract 1 c.g.  
(In phials of 24 pills.)

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## The Combined Treatment of SYPHILIS.

## SUPSALVS

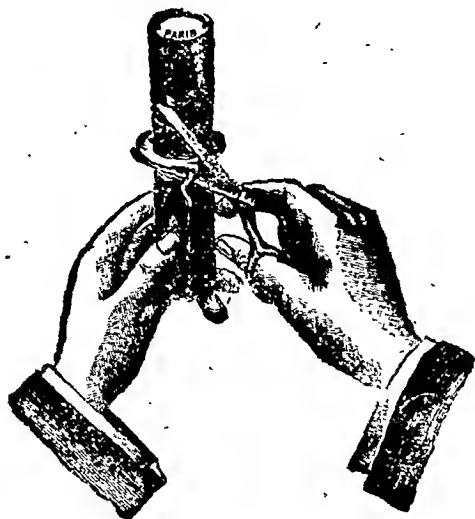
STABLE SUPPOSITORIES OF  
"606" (of French Manufacture)

FIG. 1.

Fig. 1 represents the special patent metallic envelope containing a Supsalv for hot climates. The projecting edge in the middle is cut by scissors—the two ends are then easily pulled apart. The envelope should first be immersed in cool or iced water for 10 minutes.

At the International Congress of Medicine Ehrlich stated that the biochemical action of "606" on spirochetes is not direct but indirect, a third factor found in the body fluids being necessary.

This success is explained by the well-known experiment of Lovaditi: "If living treponemas be placed in a solution of Arsenobenzol (Ehrlich's 606) they continue to live in it. But if a trace of extract of liver be added to the mixture the treponemas are destroyed."

"If 606 has to be taken up and transformed by the liver in order to become toxic to the treponema, there is no better mode of absorption of the drug than by way of the intestine, since all the veins of the intestines join the portal vein. If this be the case no route could be more indirect and more unsatisfactory for active treatment than one that is not intestinal or not intravenous (i.e., prehepatic), since some of the drug must necessarily become fixed everywhere before the passage through the liver has activated it."—Dr. Sabouraud, La Clinique (13-4-1913).

As a result of numerous clinical experiments, Dr. Bagrov, of Moscow, has arrived at the same conclusion, and recommends the rectal method of administration of 606.

200 cases were treated by the combined treatment in one of the London hospitals. In each case a negative reaction was attained.

Extremely Simple in Use.

No Ill-effects.

Most Satisfactory Clinical Results.

Rapid Absorption.

## MERSALV

FOR MERCURIAL INUNCTION IN  
CONNECTION WITH SUPSALVS  
TREATMENT.

**CHEMISTRY.**—"Mersalv" contains 10 per cent. metallic mercury, which by a special mechanical process exists in the minutest state of sub-division possible. It is a non-greasy preparation, and, in contra-distinction to other mercurial preparations, contains no organic fats or oils. "Mersalv" is of a white creamy consistence, of pleasant odour, and cleanly in application.

In Special Glass Stoppered Bottles for Hot Climates.

## IODOGÉNOL

IODINE in its Most Reliable and Palatable Form.

IODOGÉNOL is a preparation containing Iodine in an organic, assimilable and one might almost say "living" form.

IODOGÉNOL possesses about 38 times the physiological activity of that of iodide of potassium, this preparation has, according to the clinical reports of eminent professors, succeeded where the usual iodide treatment had failed after producing undesirable by-effects.

IODOGÉNOL does not produce Iodism or other bad symptoms.

IODOGÉNOL is an undoubted digestive stimulant and promotes appetite and has a markedly beneficial effect on the general nutrition. It has been tried in many of the large hospitals, and given highly satisfactory clinical results in cases of

Syphilis, Rheumatism, the various phases of Tuberculosis, General Debility, etc.

20 minims of IODOGÉNOL are equivalent to 8 grs. Iodide Potassium.

The SCIENTIFIC TREATMENT OF MALARIA  
INFLUENZA AND ALLIED AILMENTS.

## KINECTINE

According to Dr. MOUNEYRAT, the discoverer of Galy and Hectine (the widely adopted Salvarsan Substitutes).

## FORMULA:

Chlorhydrate of Quinine c. Hectine—i.e., Benzo sulfone-para-amino-phenyl-arsenate of Quinine.

Non-toxic, produces no ill-results.

Easily taken (tablets) and well tolerated.

Highly satisfactory clinical results.

Not only a Prophylactic against, but a Specific in, INFLUENZA, Catarrh, Coryza, Hay Fever, Malaria, etc.

H.M.S. —, 27-7-17.

Sir,—I enclose P.O. for the tube of Kinctine. The drug has given every satisfaction.

W. B. H. W., Surgeon, R.N.

The Anglo French Drug Co., Ltd., Holborn, London, E.C.

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# IODARGOL

Special Colloidal Iodine.  
**FOR THE TREATMENT**  
 of Gonorrhœa: Acute and  
 Chronic. Urethritis: Of  
 Old Standing.

**NON-TOXIC**  
**PAINLESS**

**DIFFUSIBLE**  
**ANTISEPTIC**  
**ANALGESIC**

Cystitis and the Serious Complications of Gonorrhœa.  
 Ampoules and Phials for Injection or Soluble Bougies.

## FOR GYNÆCOLOGY OVULES

**UTERO-TOPIQUE**  
**IODARGOL.** Direct Intra-  
 uterine Medication.

As a wound dressing Iodargol on account of its antitoxic and dermoplastic action prevents or ameliorates the fever due to infection, cuts short suppuration, eliminates the sloughing portions and cleans the wound, at the same time stimulating epidermisation and electrification.

**IOEOL OVULES** for Vaginitis, Metritis, etc.

**IOEOL CAPSULES** contain 4 grains of Iodine in each. Never cause Iodism.

*More powerful and active than Iodine without its drawbacks.*

The treatment of Carbuncles, Boils, Anthrax,  
 Acne, Styes, and diseases arising from  
**STAPHYLOCOCCUS.**

# STANNOXYL

*(An Oxide of Tin and Tin Meal  
 free from Lead.)*

A truly scientific production the value of which has been studied very closely. The effect is really wonderful; from the second day of treatment the pain is relieved and the carbuncles begin to dry up, those which are just opening are stopped in their course; the core is not expelled but reabsorbed.

In the majority of cases a complete cure is effected by the fifth or sixth day, it is seldom necessary to take the full 10 days' treatment, and relapses are unknown, indeed it is a specific for diseases arising from Staphylococcus.

The daily dose for Adults is 4 to 8 tablets;  
 Children, 2 to 4 tablets.

*Supplied in vials of 80 tablets.*

# URASEPTINE

*The Most Powerful and Effective  
 Urinary Antiseptic.*

**URASEPTINE** is a granulated product entirely soluble in water, its bases being Piperazine, Urotropine, Helmitol, Benzoates of Sodium and Lithium. It contains 80 centigrams (10 grs.) of active matter to each teaspoonful. **DOSE.**—2—6 teaspoonfuls daily.

It purifies the Urine, and this action is due to its three principal properties:

1. It is a **URINARY ANTISEPTIC.**
2. A **SOLVENT** of **URIC ACID** and of **PHOSPHATES.**
3. A **MILD NON-TOXIC DIURETIC.**

**INDICATIONS.**—Arthritism, Gout, Gravel, Hepatic and Renal Colic, Rheumatism, Calculus, etc., Phosphaturia, Urinary Antisepsis, Pyelitis, Bacteriuria, Cystitis, Prostatitis, Urethritis, Pyuria, Urinary Abscess, Vesical Catarrh, etc.

## ANTICONOCOCCIC



The clinical reports given by various doctors show that Rheantine gives highly satisfactory results, both in acute and chronic forms of Gonorrhœa and also in the various infectious complications due to Neisser's bacillus.

Rheantine is put up in hermetically sealed tins, containing 28 spherules. **Dosage.**—4 spherules a day.

Therapeutic Association of Paris (14th June, 1916): the result of their observations:—

"It is not a rare thing," write these authors, "to observe in the very first days a more or less marked recrudescence of the discharge. This negative phase, which, however, is temporary, is always followed by a well-defined positive phase, in the course of which the characteristics of the urothral pus undergo a rapid change; the discharge, which is at first thick, abundant, and creamy, passes gradually into the hyaline state, diminishes in quantity, and in the majority of cases ceases."

"Under the microscope these successive stages are demonstrated in equally definite stages; whatever may have been the duration of the disease, the characteristics of the pus become rapidly modified; after two or three days' treatment the gonococcus, first intracellular, becomes exterior; it ceases to act as a parasite on the polynuclear leucocytes and the large epithelial cells—one then finds them disseminated outside the leucocytes."

"Finally, some days later, if the administration of Rheantine is continued, the condition undergoes still further change, the gonococci become agglutinated, arranged in a mass, and finally bacteriolysed."

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# Indian Medical Gazette.

OCTOBER.

## MR. MONTAGU AND THE I. M. S.

THE Supplement to the *British Medical Journal* (dated 6th July, 1918) contains a full account of the important deputation which met Mr. Montagu, the Secretary of State, soon after his return from his tour in India. The deputation was introduced by Sir Clifford Allbutt, K.C.B., and included Lieutenant-Colonel R. H. Elliot (I. M. S., retired), (the Chairman of the Naval and Military Committee of the B. M. A.), Sir Berkeley Moynihan, K.C.M.G., Surgeon-General P. H. Benson (late Surgeon-General, Madras), Dr. Dawson Williams (the Editor of the *British Medical Journal*), Dr. J. Neal (Deputy Medical Secretary). After some plain speaking from Sir Clifford Allbutt, Lieutenant-Colonel Elliot read a clear and well arranged statement of the grievances of the service, emphasising the inadequate scale of pay, the leave difficulties, the irritating interference with private practice, and the unsatisfactory position of the administrative heads of the department with regard to direct access to the heads of the Government.

We reprint here in full the careful and sympathetic speech of the Secretary of State :—\*

Mr. Montagu said :—

Sir Clifford Allbutt and Gentlemen :—I think my first duty is to apologise to you for the great length of time which has elapsed before I saw my way to receive this deputation, and my second duty is to thank you for coming here to-day, and for giving the carefully thought out and very weighty words of warning which you have all addressed to me, particularly those of Colonel Elliot. I do not think it will be necessary for me to say that advice coming from you, the representatives of the medical profession, particularly at this moment, when your profession stands, if possible, higher than it ever did, because of the services that you have rendered both at home and in the field, will receive the most attentive and sympathetic consideration not only from me, but from the Government of India, who are charged with the responsibility of maintaining the Indian Medical Service.

*Mode in which a Final Policy must be Settled.*

Now, Gentlemen, I am going to follow the example of Colonel Elliot: I am going, if you will permit me,

\* See also the able and sympathetic speech of Sir R. Havelock Charles, at the B. M. A. meeting in London on 27th July.

to read in the main what I have to say to you. I cannot give you to-day, either in outline or in detail, a settled policy. Our policy with regard to the problems which you have brought to our notice must be carefully elaborated in a time of great pre-occupation, not by me, but by the whole Government machine—by the Government of India as a whole, by the India Council, over which I have the honour to preside, consulting together and carefully weighing all the advice and assistance which we can obtain. Therefore, I think the best thing I can do is to tell you quite frankly my own personal views, in order that you may know, at a time when the policy is not complete, what I at any rate intend to try to achieve. I do not mean to say that there is any difference of opinion among us, because I know there is not. I have recently come from India, where I have had opportunities of consultation with the Viceroy and the members of his Government, and I can say that there is not. I have no right to speak for anybody else at this stage, and I want you to understand that I am speaking for myself only.

### *The I. M. S. a Pivotal Service.*

Gentlemen, during my visit to India, I gave considerable attention, as far as I could in the time at my disposal, to informing myself as to the condition of affairs in the Indian Medical Service. I was partly influenced by the fact that I was to have the honour of meeting this deputation when I returned home, and that it was my duty to be prepared to say something to them that was worth their trouble to hear. Secondly, I knew already—and knew still more when I had been a short time in India—the unsatisfactory condition of affairs in the service. Nobody could have listened to the leaders of a great profession, as I have listened to them this afternoon, and heard of their inability to advise students to enter the Indian Medical Service under present conditions, without realizing that that was a situation which must give rise to the greatest apprehensions among those who were responsible for the future of the Service, and must reflect a very unsatisfactory state of affairs in the Service itself. Gentlemen, I was anxious to do my share in removing those grievances and apprehensions from a Service which, as Colonel Elliot has said, has so proud a history of imperial achievement—an imperial achievement which I think has never been shown more remarkably than in the contribution to our cause during the four years of war. Perhaps the fact that many years ago I approached some way towards the portals of your profession as a medical student has given me a special and peculiar interest in problems of this kind. But I think more important than any other consideration is the underlying fact that I hold for the time being a position which imposes upon me the duty of considering in all its aspects the welfare of the Indian Empire. The problem which we are confronted with to-day is not a question of doing something for the medical profession; it is not a question of doing something for the Indian Medical Service; it is a question of doing something for India by ensuring a supply of good doctors.

It is hardly worth saying—it is a platitude—that this is a vital necessity. Just as India cannot to-day, or so far as anybody can see—I was going to say for ever—do without the services of those who help to govern her, so India cannot command the services of those who help to govern her, unless the Europeans who carry the burden of the empire in India can be supplied with the best expert medical aid. And therefore as you, Sir, rightly said, the Indian Medical Service can be regarded as the pivot upon which all other imperial services in India depend. But, over and above that, the Indian Medical Service is a service on which India is mainly dependent for the satisfaction of all its manifold medical and sanitary requirements, and also—and not least—for the education of future generations of medical men in India. I therefore think it is an essential part of our duty to see that the Indian Medical Service should not be allowed to deteriorate, and I can assure you that I am determined to do everything I can to provide for India a medical service of the highest quality obtainable—a service that will be able to do its work, a service that is content with the conditions under which it works, and therefore a service whose work will be in keeping with the great traditions of the past. Therefore I am particularly anxious to express to you my gratitude for your assistance, and my threat that I shall ask the British Medical Association, in the months that are to come, for further assistance at every stage, and I shall begin by communicating to the Government of India the text of your observations to-day.

Now, before dealing with some of the detailed points that you made, I should like to state to you, if I may, my views on some of the general aspects of the case. We start by wanting, for the reasons that I have mentioned, an efficient medical service for India, and we desire it at a time when there is a world-wide demand for British doctors, at a time when the horrible national necessities of the war are taking boys who would otherwise be medical students and putting them into the army, and at a time when the way in which the members of your profession have put their services at the disposal of the armies in the field and the casualties which they have suffered, must make the supply of doctors short and the competition for their services both at home and abroad, great. Therefore it seems to me that for the reasons I have stated we must have doctors in India for the sake of India. It would be folly of the worst possible kind not to prepare to offer when peace comes, such conditions of service to the doctors whom we require as to ensure successful competition with the other people who want them as we do.

#### *Abnormal War Conditions.*

I need not remind you that the Indian Medical Service is not a purely military service. It has its military side and it has its civil side. In war the military side of the service necessarily altogether overshadows the civil. I believe I am right in saying that no less than 339 officers have been reverted from civil to military duty. This in itself has, I think, aggravated the discontent which all have to admit by abnormal

conditions, by the friction which compulsory reversion to military duty necessarily involves, by the misunderstandings about pay, by the opportunity for the closest comparison with the R.A.M.C., and finally by the suspension of retirements owing to the necessity of keeping the service up to its maximum strength by the retention of all efficient officers. In so far as discontent arises from these abnormal conditions, I can assure you that both the Government of India and I will do our best to grapple with the difficulties. We have improved the rates of staff pay in the field; we have developed a scheme of accelerated and acting promotion to prevent supersession of Indian Medical Service officers by officers of the R.A.M.C.; and, finally, we have made promotions in the place of officers who have had to be retained beyond the normal limit. Details of these steps have already been published in the press. In addition, two temporary surgeons-general have recently been appointed to meet the special needs of the war, and at this moment we are considering here a proposal of the Government of India to create certain additional military administrative appointments in the Indian Medical Service carrying the rank of colonel.

#### *Normal Conditions.*

However, apart from these abnormal conditions, we are really concerned this afternoon in the preparation of conditions for normal times, and therefore I want to lay down four governing principles which it appears to me must be achieved for those normal times.

#### *Opportunities to Advance Medicine: A Unified Service.*

First of all I would suggest to you that a medical man in the Indian Medical Service must be ensured suitable opportunities of what perhaps I may call interesting practice. It must be worth his while professionally and scientifically. It must offer him opportunities of contributing by a wide experience to the knowledge of his profession and therefore to the possible cure or prevention of the ills from which humanity suffers. I am told that there is no country in the world professionally more attractive than India, and I think, therefore, that the opportunities which the country affords must be at the disposal of those whom we ask to come out from this country to serve her. The application of this principle would make it, I think, impossible, or, at any rate, difficult, to separate the military side of the Indian Medical Service from the civil side. I do not wish to pre-judge the question, but it would appear to me that neither the military side nor the civil side alone would fulfil the principle which I have just stated.

#### *Private Practice*

Then I come, as Sir Berkeley suggested, to the question of private practice. My views on this matter can be very shortly stated. It would be contrary, in my opinion, to this first principle to deprive members of the Indian Medical Service of their opportunities of private practice.

The question has recently been most carefully examined, both in this office and in India. It has two

chief aspects: First, what is the legal position? Has an officer in the Indian Medical Service any right vested in statute to private practice? Secondly, whatever the legal position, what is the attitude to this question likely to prove most advantageous to the officials and peoples of India, whose servant he is? As to the legal position, I am advised by the authorities of this office—and with this opinion the Government of India, who have gone into the matter independently, agree—that there is nothing in the state of the law at the present time which gives an officer of the Indian Medical Service a statutory right of private practice, whether within certain prescribed limits or as a general permission. Government is quite free to make what rules it likes for the Indian Medical Service on this question. I am glad that it is so. It seems to me that it would be an intolerable position for the Government of India as an administrator of a great service to have its freedom of administration circumscribed in so important a matter.

But the practical matter of policy is much more important than the legal position. What is best for the peoples of India and for the service itself? Let me state the position as I understand it. In the first place the Government has thought it necessary to debar the holders of certain posts from the privilege of private practice. They think it necessary to retain that power, and to exercise it by revising the list from time to time. Secondly, the Government consider that they must retain power to determine the conditions under which the privilege of private practice may be exercised, and to see that the exercise of it does not interfere with the efficient discharge of the officer's duties, and that in regard to professional charges the privilege is not abused. Having considered the matter very carefully, I personally am satisfied that the present arrangement, which gives freedom to practise privately within well recognized and quite wide limits, is open to no serious objection, either from the point of view of the interests of the Indian Medical Service or from that of the peoples of India. Their interests in the matter must be recognized. It is arguable—and I for one would certainly argue—that it is to their interests that every possible encouragement should be given to the development of an indigenous private medical profession; it might then be contended that one way of doing so would be to circumscribe the opportunities of Government doctors to private practice or even to take away those opportunities altogether. But, as I have already stated, I could not subscribe to such a view as that. It seems to me better in every way that this indigenous medical profession should grow up in an atmosphere of free competition with highly trained European doctors. Competition of this kind sets a high standard, and consequently encourages and maintains a strong connexion with Western medical schools and methods. I see, therefore, no reason for curtailing the present privileges of the Indian Medical Service in the matter of private practice and many reasons against doing so, chief among which I would say that it would derogate from the principle which I am trying to establish—that the

scientific and professional opportunities of the country must be at the disposal of the officers of the service. Of course private practice must not be allowed to encroach upon public duty. Everybody agrees that the State comes first, but it is in the interests of the State that in the time at his disposal the doctor should benefit by the opportunities of private practice, and it seems to me at this stage, although I cannot express any final opinion, that any abuse of this privilege can be cured by the ordinary methods of service discipline, and I would leave it at that. So much for the first principle.

#### *Pay and Emoluments at Present Inadequate.*

My second principle is that the remuneration offered to the service should be adequate. Speaking for myself again, I consider that the pay and emoluments of the service are inadequate at present and are admittedly in need of revision. So far as concerns the military side of the service, the introduction of the station hospital system for Indian troops will afford an opportunity of reconsidering the present scales of pay and instituting a comparison between the emoluments of Indian Medical Service officers and those of R.A.M.C. officers under their station hospital system. I regret I am not able yet to announce any decision as regards civil pay, but I recognize the urgency of this side of the question, even at a time when so many of the doctors ordinarily on the civil side are temporarily on the military side, and I intend to use the full weight of my authority in pressing the matter to a decision, which, in spite of the difficulties which we all recognize I consider has been too long delayed already.

#### *Leave.*

The question of leave is closely connected with that of pay and emoluments. Of course, there were difficulties in obtaining leave before the outbreak of war. The public Services Commission considered that the reserves for leave, deputation, and training needed recalculation, and, though it is impossible, during the continuance of the war, to arrive at any satisfactory solution of this question, the Government of India and I are both fully alive to its importance. Improved rates of sterling leave pay for the officers in military employ are under consideration, and I hope will be announced shortly. The cadre of the service must provide for an adequate leave reserve, because it is obvious that sufficient periodic holidays at home are necessary for Europeans serving in India.

#### *Increased Opportunities for Indians to Enter.*

Now I come to my third principle, and that is that the Indian Medical Service must afford in its organization increased and increasing opportunities for Indians to enter the service. I am sure you will admit that this is essential if the service is to continue to be firmly established in the respect of the people of India. It is in harmony with the policy of His Majesty's Government as regards all services as expressed by them through me on August 20 last. The application of this principle means that Indians must be trained either in this

country, or—I hope increasingly—by improvement and extension of the opportunities for medical education in India, to enter the service on equal conditions and with equal opportunities of promotion. This involves, among other things, the development of aided schools and colleges in India. I need hardly say, but I ought to say, that the assertion of this principle is not intended to detract from the necessity of keeping an adequate proportion of officers from home, both to supply the needs of the European service and to maintain the traditions of the service.

*Minor Causes of Irritation, Friction, and Annoyance.*

My fourth principle is that the conditions of the service shall be as free as we can make them from irritation, friction, or annoyance. Now it is not only the correspondence which I receive, and which you all, I am sure, receive, but not only my visit to India that has convinced me—but I think even the most superficial observer would acknowledge that this condition is not fulfilled at the present time. There is great unhappiness in the service. Dr. Elliot has brought to my notice something that has been said about threatened resignations. The best way of dealing with that, Gentlemen, is to remove the causes for unhappiness that make people want to resign, and I look forward to the day when Sir Berkeley Moynihan will use his unrivalled opportunities to persuade people to go into the Indian Medical Service, when people will go about their work so happily that nobody will talk of resignation, and when every one will regret the time when advancing age makes return home necessary. Some of the unhappiness can undoubtedly be cured by attention to the specific points which you have raised, by attention to some of the matters with which I have already incidentally dealt in discussing my principles.

*The I.M.S. and the R.A.M.C. in India.*

But there is one over-riding consideration which Sir Berkeley Moynihan referred to—one matter which, apart from doubts as to the future as regards professional opportunity or pay, seems to me to make for a dangerous state of affairs. It is in the relations between the R.A.M.C. as employed in India and the I.M.S. It does not seem to me to be possible that, with two services, the relations of which are so intimate and peculiar as the relations between these two services, you can avoid the friction which is happening from day to day. It is alleged that faults of one are visited on the shoulders of the other; that credit due to one is given to the other; that promotion in one is delayed by the other; that the prestige of one is greater than the prestige of the other; that the claims of one, or, if I may use an expression which must not be taken too literally, the grievances of one receive better attention than the claims or the grievances of the other. Is not this—I put it forward very tentatively—inseparable from the maintenance of the two services, side by side, as separate organizations in India? I do not now express a positive and definite opinion as to which of the two services should be absorbed in the other, or what name

you should give the new service. That must depend largely upon other considerations which will be determined by the events of this war. I do not even now say that "absorption" is the right word to use. What I do say is that the two services must be considered together with a view, to promoting harmony, and with a view, so far as is possible, to achieving unification. I think that this means a drastic reorganization of the Indian Medical Service, and a drastic reorganization of the relations of the Indian Medical Service, to the Government, which you, Sir, mentioned. I think we should be prepared for this, and that we should be ready with some scheme of reorganization for the time when recruiting starts again in full swing after the war, and I think that that reorganization should proceed with the view and intention of ensuring the four principles that I have just enunciated.

I have already brought my views on this matter to the attention of the Government of India, and I assure you that I shall continue, despite their great preoccupations, to do so. I discussed the matter with prominent members of the Indian Medical Service and with the military authorities in India and my conviction that prompt action was necessary was confirmed by all that I heard. I do not mean by "pressure" that pressure on the Government of India is necessary, for I am satisfied, and I know, that their actions will show they realize the urgency of the case as much as I do. All that I mean is that from this side, as I know from their side, we will not lose sight of the matter or let the grass grow under our feet. I am sure I may hope that when we are preparing our scheme, when we are formulating our new organization, the British Medical Association will give us the benefit of their advice, because I am very anxious that whatever scheme is adopted should have their approval.

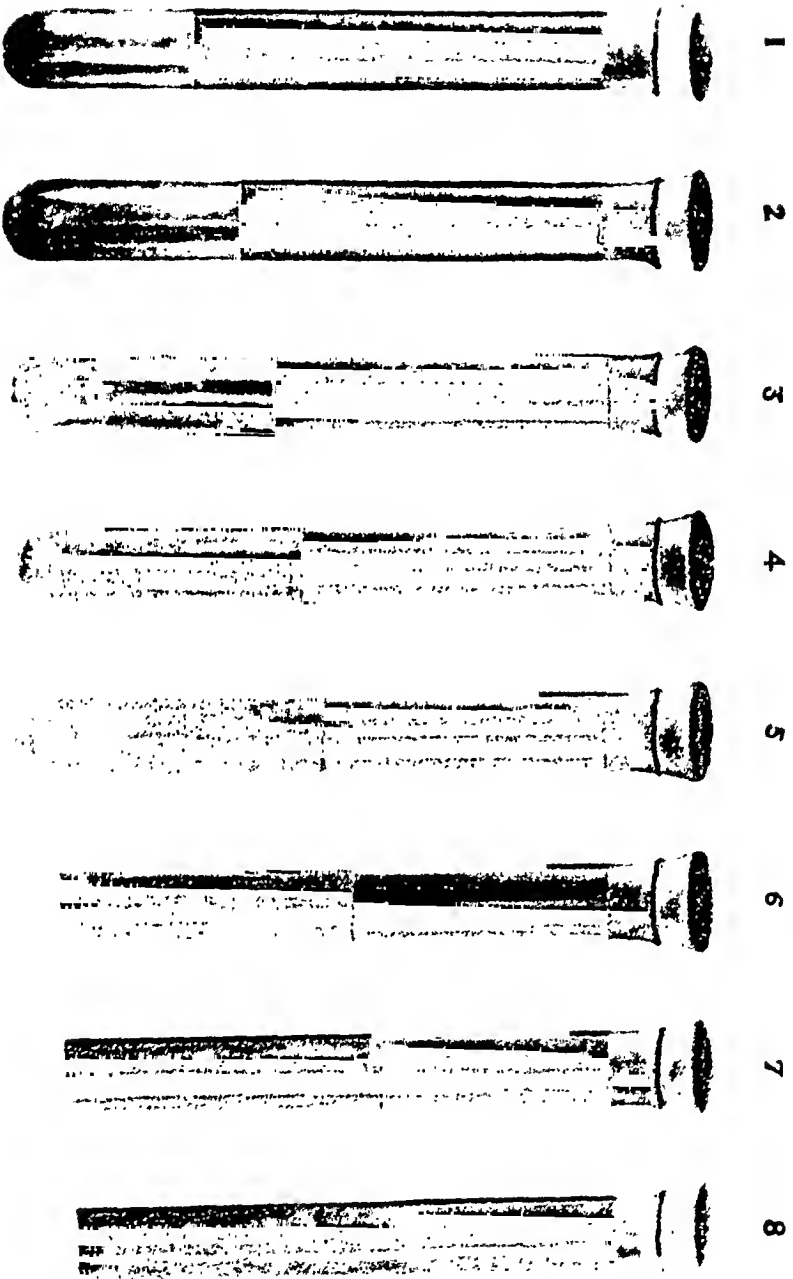
*Medical Advisers of the Secretary of State, the Government of India, and Local Governments.*

Gentlemen, I am afraid I have taken up a great deal of your time, but, if you have not completely lost patience, I want to deal with one or two points which I have picked out, not because I have omitted the others from the considerations that you have brought before me. I need hardly say that I entirely agree that the Secretary of State, the Government of India, and the Local Governments require and should take all suitable means to obtain the best and most accessible advice obtainable on the very various medical and sanitary problems with which a modern Government is called upon to deal. As you are aware, the duties of the medical personnel of this office were considered by my predecessor and more particularly defined. The Secretary of State's Medical Adviser, who had recently been liberated from the routine duties of the Medical Board, has now powers and responsibilities which are as particularized in your representation. The medical adviser acts also as an appeal board when required. So much for this office. The exact relations between the Government of India and the Local Governments and their respective medical advisers I feel I must





PLATE I.



leave to be worked out locally; but I propose, as I said before, to communicate a copy of the proceedings of this deputation to the Government of India at once, so that the whole question may be fully considered by the authorities in that country.

#### *Education and Recruitment.*

As regards education and recruitment, you recommend three things: First, that candidates from India should be required to undergo a period of training in British medical schools, especially in the diseases of women and children; secondly, that successful candidates for the service should be encouraged to hold resident hospital appointments—I think you said “made to hold”—

SIR BERKELEY MOYNIHAN: Yes, sir.

THE SECRETARY OF STATE: And, thirdly, that facilities for study leave or study periods are of great importance. I am in full agreement with your Association as to the first—that all members of the Indian Medical Service should have had training in the diseases of women and children. As regards the suggestion that training must necessarily be in British medical schools, you will no doubt recall that the Public Services Commission made specific recommendation that such training should be required, and remarked that the means for acquiring it are lacking in many parts of India. In so far as this deficiency exists in India, I agree that the training must be acquired in this country; but I look forward with confidence to the time when India itself will provide facilities for an all-round medical training. I also entirely agree that it is desirable that successful candidates should, to as full an extent as the exigencies of the service may permit, have held resident hospital appointments. Full provision for their being seconded for this purpose already exists.

As regards study periods, I am fully alive to the advantages they offer, and in the year before the war—no less than eighty officers went through these courses of study, and only the war has put a stop to them. This leave carries allowances with it, and is not debited against ordinary leave. It qualifies now for accelerated promotion where evidence is produced that the course of study undertaken has been properly pursued. I will bring your suggestions, Sir Clifford, specially to the notice of the Government of India. The importance of affording officers' opportunities, during the early part of their service in India, of attending the practice of hospitals in the Presidency and other large towns is one of those questions which must necessarily await the return of normal conditions.

Then, when you talked of recruitment, you observed that the grant of permanent commissions by selection should be kept within the narrowest possible limits, and that it should be made plain that the grant of temporary commissions in the Indian Medical Service should carry with it no guarantee of subsequent permanent appointment. As regards the second point, there is a clause in the agreement which every temporary officer is required to sign, which perhaps I

may quote to you: “I accept this agreement on the understanding that it confers no claim to permanent appointment to the Indian Medical Service.” At the same time it must be obvious that a man's record of temporary service rendered under the exacting conditions of war will be a most valuable criterion of the qualities of initiative, self-reliance, and pluck which are so necessary in the case of a service like the one we are discussing. I am heartily in agreement with your view that the appointments made by selection should be confined within the narrowest possible limits. I think I can claim that the actual number of appointments made—36—since the institution of the Selection Committee in the autumn of 1915 fully proves that the pledge publicly given at the time when the Committee was established—namely, that appointments would be made only to provide for the absolutely indispensable needs of the service has been fully adhered to. The composition of the Committee is, I think, a sufficient guarantee that no candidates have been appointed who did not fully come up to the standard of success demanded by competitive examination. In the great majority of cases, candidates, in addition to academic distinction won, had proved their fitness by service well rendered in the field. My only anxiety is that, as the war goes on, the number of appointments which it will be necessary to make at its completion, or so soon after as it may be possible to fill up the depleted cadre of the service, continually increases. At present the estimate of such appointments reaches the minimum number of 150.

#### *Research.*

There is only one other topic upon which I should like to say a word. I can assure Sir Clifford Allbutt of my sympathy with everything that he has said about research. Sir Pardey Lukis established the Research Association, and the *Journal of Research* bears witness to its work. It is only a few weeks ago since I myself visited the Parel Laboratories, in Bombay, where Colonel Liston is conducting such good research work, especially on plague and serums generally, and I am sure you will admit, as you stated when you opened the proceedings this afternoon, that there are many examples of valuable research being done in India. You and I are in complete agreement in thinking that opportunities for research and reward for research form an important part in the considerations which are necessary to ensure a good medical service in India.

#### *General Agreement between the Viceroy and the Secretary of State.*

Gentlemen, that is all I have to say to you this afternoon, and I am sorry to have detained you so long. What I have said has been more in the nature of a frank expression of my own views than an attempt to formulate in detail a new policy. I have to repeat that both the Viceroy and I, who have only recently been discussing this subject together, are fully alive to the importance of the problem which you are here to present to me, and I am awaiting the proposals of the Government of India. I feel optimistic; and I have

no doubt that, with the assistance which I am sure you will give us, with the medical advice which he and I have at our disposal, we shall find a solution which will put an end to the present unsatisfactory condition of affairs, which will ensure for India the medical assistance which she needs, and which will ensure a future for your profession in that country as worthy and as important as its past history.

Sir CLIFFORD ALBUTT: Will you allow me, Sir, to thank you not merely for your great courtesy in receiving us this evening, but for the very full and careful consideration you have given to our views?

### I. M. S. AND THE HONOUR LISTS.

A CORRESPONDENT recently asked us if we could give a list of all I. M. S. officers who had been decorated during the present war. It might be expected that the Indian Army List would give the information required and to some extent this is true, but while British honours are generally noted after the names of officers so honoured, this is not the case with the fairly large number of foreign honours, or with some minor honours. These are, however, grouped together in a separate list.

The suggestion of our correspondent recurred to us when on receipt of the belated (July) issue of the Indian Army List we turned over its pages. Opening the July Army List at page 729, we find the lists commence, rightly, with the Victoria Cross. The following list is not confined to war honours only:—

#### VICTORIA CROSS.

|  |     |      |
|--|-----|------|
| Colonel J. Crimmin, C.B., C.I.E.   | ... | 1889 |
| Surgeon-Major Martin Leake, of Bengal-Nagpur Railway, v.c., 1902, and a clasp to the v.c. awarded in the present war | ... |      |
| Capt. J. A. Sinton, I.M.S.   | ... | 1916 |
| (also Order of St. George of Russia)   |     |      |

#### K. C. B.

|   |     |      |
|---|-----|------|
| Surgeon-General Sir Horace Hamilton     | ... | 1913 |
| Sir Peter Freyer                        | ... | 1918 |
| Sir Ronald Ross (Civil) (also K.C.M.G.) | ... | 1911 |

#### C. B.

|  |     |      |
|--|-----|------|
| Colonel C. H. Beatson                                  | ... | 1907 |
| Colonel J. T. B. Bookey                                | ... | 1900 |
| Colonel Sir R. Neil Campbell (K.C.M.G., C.I.E., K-I-H) | ... | 1910 |
| Colonel J. Crimmin, v.c., C.I.E.                       | ... | —    |
| Major-General W. R. Edwards (C.M.G.)                   | ... | 1914 |
| Sir Peter J. Freyer (K.C.B., 1918)                     | ... | 1917 |
| Surgeon-General Tom Grainger                           | ... | 1912 |
| Colonel P. B. Haig (K-I-H)                             | ... | 1917 |
| Major-General P. Hehir (C.M.G., C.I.E.)                | ... | 1915 |
| Colonel G. B. Irvine                                   | ... | 1916 |
| Lieut.-Colonel C. A. Johnston (D.S.O.)                 | ... | 1917 |

|   |     |      |
|---|-----|------|
| Major-General C. C. Manifold (C.M.G.)   | ... | 1914 |
| Colonel H. R. McKay (C.I.E.)            | ... | 1906 |
| Colonel F. P. O'Connor                  | ... | 1902 |
| Major-General W. H. B. Robinson (K-I-H) | ... | 1915 |
| Lieut.-Colonel J. B. Smith              | ... | 1918 |
| Lieut.-Colonel L. A. Waddell (C.I.E.)   | ... | 1904 |
| Lieut.-Colonel W. Westrop White         | ... | 1916 |
| Colonel C. F. Willis                    | ... | 1911 |

#### K. C. S. I.

|                          |     |      |
|--------------------------|-----|------|
| Colonel Sir W. R. Hooper | ... | 1903 |
|--------------------------|-----|------|

#### C. S. I.

|   |     |      |
|---|-----|------|
| Colonel H. E. Banatwala                 | ... | 1917 |
| Surgeon-General Bannerman               | ... | 1911 |
| Surgeon-General J. Cleghorn             | ... | 1897 |
| Major-General G. G. Giffard             | ... | 1913 |
| Surgeon-General G. F. A. Harris         | ... | 1911 |
| Surgeon-General D. Sinclair             | ... | 1898 |
| Surgeon-General H. W. Stevenson (K-I-H) | ... | 1912 |

#### K. C. M. G.

|                                     |     |      |
|-------------------------------------|-----|------|
| Sir R. Neil Campbell (C.B., C.I.E.) | ... | 1917 |
| Sir Ronald Ross (K.C.B., F.R.S.)    | ... | 1918 |

#### C. M. G.

|   |     |      |
|---|-----|------|
| Lieut.-Colonel C. H. Bowle Evans                  | ... | 1915 |
| Lieut.-Colonel J. Chaytor White                   | ... | 1917 |
| Major H. M. Crnddas                               | ... | 1916 |
| Major-General W. R. Edwards (C.B.)                | ... | 1900 |
| Lieut.-Colonel J. A. Hamilton                     | ... | 1916 |
| Major-General P. Hehir (C.B., C.I.E.)             | ... | 1917 |
| Lieut.-Colonel C. T. Hudson                       | ... | 1918 |
| Lieut.-Colonel E. Victor Hugo                     | ... | 1917 |
| Major W. W. Jeudwine                              | ... | 1916 |
| Lieut.-Colonel J. N. Macleod (C.I.E.)             | ... | 1917 |
| Major-General C. C. Manifold (C.B.)               | ... | 1917 |
| Lieut.-Colonel D. H. Ogilvie                      | ... | 1917 |
| Lieut.-Colonel C. W. Owen (C.I.E.)                | ... | 1887 |
| Lieut.-Colonel F. F. Perry                        | ... | 1917 |
| Lieut.-Colonel Sir D. Prain (Kt., C.I.E., F.R.S.) | ... | 1912 |
| Lieut.-Colonel D. G. Pridmore                     | ... | 1915 |
| Lieut.-Colonel J. C. Robertson (C.I.E.)           | ... | 1917 |
| Lieut.-Colonel S. Browning Smith                  | ... | 1917 |
| Lieut.-Colonel T. H. Sweeny                       | ... | 1917 |
| Bt.-Lieut.-Colonel F. Wall                        | ... | 1915 |
| Colonel C. N. C. Wimberley                        | ... | 1917 |

#### K. C. I. E.

|   |     |      |
|---|-----|------|
| Lieut.-Colonel Sir Walter Buchanan (C.I.E.) | ... | 1918 |
| Surgeon-General Sir Benj. Simpson           | ... | 1887 |

#### C. I. E.

|  |     |      |
|--|-----|------|
| Lieut.-Colonel A. W. Alcock (F.R.S.)       | ... | 1903 |
| Lieut.-Colonel J. Anderson                 | ... | 1917 |
| Bt.-Lieut.-Colonel F. A. F. Barnardo       | ... | 1918 |
| Lieut.-Colonel C. C. S. Barry              | ... | 1915 |
| Colonel T. E. L. Bate                      | ... | 1902 |
| Colonel E. J. H. Bell                      | ... | 1914 |
| Major H. C. Brown                          | ... | 1918 |
| Colonel S. Hazlett Browne                  | ... | 1896 |
| Surgeon-General W. R. Browne               | ... | 1906 |
| Lieut.-Colonel W. R. Browning              | ... | 1890 |
| Lieut.-Colonel H. Burden                   | ... | 1911 |
| Sir R. Neil Campbell (K.C.M.G., C.B.)      | ... | 1909 |
| Major S. R. Christophers                   | ... | 1915 |
| Bt.-Colonel H. F. Cleveland                | ... | 1918 |
| Colonel J. Crimmin (v.c., C.B.)            | ... | 1902 |
| Colonel G. W. P. Dennys                    | ... | 1915 |
| Major F. F. Elwes                          | ... | 1911 |
| Major W. Gillitt                           | ... | 1916 |
| Lieut.-Colonel S. H. D. Gimlette           | ... | 1901 |
| Bt.-Lieut.-Colonel C. M. Goodbody (D.S.O.) | ... | 1918 |
| Major E. W. D. Greig                       | ... | 1914 |

\* Other or previous honours in brackets. The Army List, of course, only gives the names of officers still alive.—ED.

|   |     |      |                               |     |      |
|---|-----|------|-------------------------------|-----|------|
| Major-General P. Hehir (C.B., C.M.G.)           | ... | 1918 | Major E. T. Harris            | ... | 1917 |
| Major D. Heron                                  | ... | 1918 | Capt. R. deS. B. Herrick      | ... | 1916 |
| Major (Hony.) T. Hill, I.S.M.D.                 | ... | 1901 | Lieut.-Colonel J. H. Hugo     | ... | 1898 |
| Lieut.-Colonel J. G. Hojel                      | ... | 1917 | Lieut.-Colonel C. A. Johnston | ... | 1917 |
| Lieut.-Colonel J. Jackson                       | ... | 1916 | Capt. J. W. Jones             | ... | 1916 |
| Lieut.-Colonel C. H. James                      | ... | 1912 | Lieut.-Colonel T. B. Kelly    | ... | 1918 |
| Lieut.-Colonel W. B. Lane                       | ... | 1918 | Major R. Kelsall              | ... | 1916 |
| Lieut.-Colonel W. Glen Liston                   | ... | 1913 | Major G. C. L. Kerans         | ... | 1916 |
| Lieut.-Colonel J. N. Macleod (C.M.G.)           | ... | 1918 | Lieut.-Colonel R. Knox        | ... | 1915 |
| Colonel R. C. MacWatt (K-I-H)                   | ... | 1916 | Major R. A. Lloyd             | ... | 1917 |
| Colonel H. K. McKay (C.B.)                      | ... | 1898 | Capt. E. R. Lyon              | ... | 1917 |
| Colonel C. Mactaggart                           | ... | 1911 | Lieut.-Colonel W. R. Murphy   | ... | 1890 |
| Lieut.-Colonel F. O. N. Mell                    | ... | 1917 | Major R. A. Needham           | ... | 1910 |
| Colonel D. Molesworth                           | ... | 1914 | Major T. G. F. Paterson       | ... | 1917 |
| Major D. Munro                                  | ... | 1917 | Lieut.-Colonel E. C. Perry    | ... | 1917 |
| Lieut.-Colonel Bhola Nauth                      | ... | 1917 | Capt. E. S. Phipson           | ... | 1916 |
| Lieut.-Colonel E. A. R. Newman                  | ... | 1918 | Major E. A. Roberts           | ... | 1918 |
| Lieut.-Colonel C. W. Owen (C.M.G.)              | ... | 1881 | Capt. J. Scott                | ... | 1918 |
| Lieut.-Colonel F. F. Perry (C.M.G.)             | ... | 1908 | Capt. R. Sweet                | ... | 1916 |
| Lieut.-Colonel Sir D. Prain (Kt., C.M.G.)       | ... | 1906 | Lieut.-Colonel W. A. Sykes    | ... | 1887 |
| Lieut.-Colonel Sir J. R. Roberts (Kt.)          | ... | 1911 | Capt. J. Taylor               | ... | 1915 |
| Lieut.-Colonel J. C. Robertson (C.M.G.)         | ... | 1914 | Capt. A. N. Thomas            | ... | 1917 |
| Lieut.-Colonel Sir Leonard Rogers (Kt., F.R.S.) | ... | 1911 | Lieut.-Colonel R. G. Turner   | ... | 1917 |
| Lieut.-Colonel B. J. Singh                      | ... | 1918 | Major C. H. Watson            | ... | 1917 |
| Lieut.-Colonel Henry Smith (K-I-H)              | ... | 1918 | Major H. A. Williams          | ... | 1917 |
| Lieut.-Colonel H. Austin Smith                  | ... | 1918 | Lieut.-Colonel F. W. Wright   | ... | 1887 |
| Major W. D. H. Stevenson                        | ... | 1918 |                               |     |      |
| Lieut.-Colonel D. W. Sutherland                 | ... | 1917 |                               |     |      |
| Major (tempy. Lieut.-Colonel) J. G. G. Swan     | ... | 1918 |                               |     |      |
| Lieut.-Colonel S. J. Thomson                    | ... | 1898 |                               |     |      |
| Lieut.-Colonel L. A. Waddell (C.B.)             | ... | 1901 |                               |     |      |
| Major F. Norman White                           | ... | 1916 |                               |     |      |

# KNIGHT GRAND CROSS OF THE ROYAL VICTORIAN ORDER.

## G.C.V.O.

Surgeon-General Sir R. Havelock Charles  
(K.C.V.O.) ... 1912

## M.V.O. (4TH CLASS.)

Colonel C. J. Bamber ... 1911

# ORDER OF THE BRITISH EMPIRE.

## C.B.E.

Lieut.-Colonel Jay Gould ... 1917

## O.B.E.

Major E. W. C. Bradfield ... 1918  
Lieut.-Colonel J. M. Crawford ... 1918  
Major H. Ross ... 1918  
Major Hugh Stott ... 1918  
Lieut.-Colonel T. H. Symons ... 1917

# DISTINGUISHED SERVICE ORDER.

## D.S.O.

Lieut.-Colonel H. J. K. Bamfield ... 1917  
Major R. M. Barron ... 1918  
Lieut.-Colonel W. R. Battye (Legion of Honour) ... 1916  
Capt. P. B. Bhuracha ... 1916  
Lieut.-Colonel G. Browne ... 1917  
Capt. R. C. Clifford ... 1916  
Lieut.-Colonel F. Power Connor ... 1918  
Lieut.-Colonel J. Davidson ... 1912  
Major I. P. Doyle ... 1889  
Lieut.-Colonel W. H. W. Elliot ... 1900  
Lieut.-Colonel J. Fisher ... 1898  
Lieut.-Colonel A. B. Fry (Leg. of Honour) ... 1917  
Lieut.-Colonel G. E. L. Gilbert ... 1908  
Major S. R. Godkin ... 1917  
Bt.-Lieut.-Colonel C. M. Goodbody (C.M.G.) ... 1917  
Lieut.-Colonel C. A. Gourlay ... 1918  
Capt. P. F. Gow ... 1917  
Lieut.-Colonel W. H. Hamilton ... 1916

Major E. T. Harris ... 1917  
Capt. R. deS. B. Herrick ... 1916  
Lieut.-Colonel J. H. Hugo ... 1898  
Lieut.-Colonel C. A. Johnston ... 1917  
Capt. J. W. Jones ... 1916  
Lieut.-Colonel T. B. Kelly ... 1918  
Major R. Kelsall ... 1916  
Major G. C. L. Kerans ... 1916  
Lieut.-Colonel R. Knox ... 1915  
Major R. A. Lloyd ... 1917  
Capt. E. R. Lyon ... 1917  
Lieut.-Colonel W. R. Murphy ... 1890  
Major R. A. Needham ... 1910  
Major T. G. F. Paterson ... 1917  
Lieut.-Colonel E. C. Perry ... 1917  
Capt. E. S. Phipson ... 1916  
Major E. A. Roberts ... 1918  
Capt. J. Scott ... 1918  
Capt. R. Sweet ... 1916  
Lieut.-Colonel W. A. Sykes ... 1887  
Capt. J. Taylor ... 1915  
Capt. A. N. Thomas ... 1917  
Lieut.-Colonel R. G. Turner ... 1917  
Major C. H. Watson ... 1917  
Major H. A. Williams ... 1917  
Lieut.-Colonel F. W. Wright ... 1887

## I. S. O.

Hony. Major S. A. S. Courtney (M.C.) ... 1918  
(Both honours dated 3rd June, 1918, in Army List.)

# THE MILITARY CROSS.

## M. C.

Capt. F. J. Anderson ... 1917  
Tempy. Lieut. V. K. Apte ... 1918  
Capt. D. Arthur ... 1916  
Capt. C. H. N. Baker ... 1917  
Lieut. N. K. Bal ... 1915  
Capt. H. L. Batta ... 1918  
Lieut. C. W. W. Baxter ... 1918  
Asst. Surgeon F. B. M. Braganza ...  
Capt. R. C. Clifford ... 1916  
Capt. H. S. Cormack ... 1916  
Hon. Major S. A. S. Courtney (I.S.O.) ... 1918  
Capt. V. A. Cruickshank ... 1916  
Tempy. Capt. A. V. Dabholkar ... 1917  
Lieut. E. R. Daboo ... 1917  
Capt. M. Das ... 1918  
Capt. C. N. Davies ... 1918  
Capt. A. N. Dickson ... 1917  
Lieut. S. Dutt ... 1918  
Capt. T. J. C. Evans ... 1916  
Capt. D. Fitzgerald ... 1916  
Capt. P. K. Gilroy ... 1918  
Sub-Asst. Surgeon Gopinath Agarwal ... 1916  
Capt. S. Gordon ... 1917  
Capt. E. S. Goss ... 1916  
Capt. H. S. G. Haji ... 1918  
Capt. Hari Chand ... 1917  
Capt. R. W. G. Hingston ... 1916  
Lieut. W. P. Hogg ... 1918  
Capt. R. S. Kennedy ... 1917  
Asst. Surgeon J. D. M. Lamond ... 1916  
Capt. J. V. Macdonald ... 1917  
Capt. R. F. D. MacGregor ... 1916  
Asst. Surgeon E. B. Messinier ... 1915  
Capt. S. H. Middleton West ... 1917  
Capt. J. S. O'Neill ... 1915  
Capt. W. C. Paton (White Eagle, Serbia) ... 1916  
Capt. D. H. Rai ... 1916  
Sub-Asst. Surgeon R. G. Shinde ... 1915  
Capt. C. H. Reinhold ... 1917  
Capt. W. H. Riddell ... 1916  
Asst. Surgeon Rodergues ... 1916  
Capt. H. K. Rowndtree ... 1916

|                                  |     |     |      |
|----------------------------------|-----|-----|------|
| Capt. J. L. Sen                  | ... | ... | 1916 |
| Capt. N. S. Sodhi                | ... | ... | 1917 |
| Tempy. Lieut. S. D. Sendhi       | ... | ... | 1916 |
| Lieut. C. J. Stocker             | ... | ... | 1916 |
| Capt. R. S. Townsend             | ... | ... | 1916 |
| Capt. C. A. Wood (+ Bar to M.C.) | ... | ... | 1916 |
| T. W. Woodseil, I.S.M.D.         | ... | ... | 1917 |

## KAISER-I-HIND MEDAL.

## 1st Class Gold Medal.

|   |     |     |      |
|---|-----|-----|------|
| Capt. R. H. Bott                              | ... | ... | 1917 |
| Sir R. Neil Campbell (K.C.M.G., C.B., C.I.E.) | ... | ... | 1900 |
| Lieut.-Colonel A. Gwyther                     | ... | ... | 1911 |
| Lieut.-Colonel P. B. Haig (C.B.)              | ... | ... | 1913 |
| Asst. Surgn. Hy. Captain W. J. A. Hogan       | ... | ... | 1914 |
| Major J. H. Husband                           | ... | ... | 1915 |
| Lieut.-Colonel T. W. Irving                   | ... | ... | 1911 |
| Lieut.-Colonel C. H. James (C.I.E.)           | ... | ... | 1900 |
| Major-General R. W. S. Lyons                  | ... | ... | 1903 |
| Lieut.-Colonel R. McCarrison                  | ... | ... | 1910 |
| Colonel J. McCloghry                          | ... | ... | 1901 |
| Lieut.-Colonel R. C. MacWatt (C.I.E.)         | ... | ... | 1908 |
| Hon. Capt. J. Morrison                        | ... | ... | 1908 |
| Major E. J. O'Meara                           | ... | ... | 1909 |
| Surgeon Lieut.-Colonel T. F. Podley           | ... | ... | 1902 |
| Lieut.-Colonel J. L. Poynder                  | ... | ... | 1902 |
| Lieut.-Colonel K. Prasad                      | ... | ... | 1917 |
| Major E. R. Rost                              | ... | ... | 1913 |
| Lieut.-Colonel R. Shore                       | ... | ... | 1900 |
| Lieut.-Colonel Henry Smith (C.I.E.)           | ... | ... | 1911 |
| Major C. E. Southon                           | ... | ... | 1914 |
| Surgeon-Major W. Stokes                       | ... | ... | 1914 |
| Major W. H. Tucker (Legion of Honour)         | ... | ... | 1911 |
| Major J. R. J. Tyrell                         | ... | ... | 1911 |
| Lieut.-Colonel J. C. S. Vanghan               | ... | ... | 1910 |
| Major A. E. Walter                            | ... | ... | 1911 |
| Major E. L. Ward                              | ... | ... | 1913 |
| Colonel J. S. Wilkins                         | ... | ... | 1901 |
| Lieut.-Colonel E. Wilkinson                   | ... | ... | 1901 |

## 2nd Class K. I. II Silver Medal.

|  |     |     |       |
|--|-----|-----|-------|
| Sub-Asst. Surgeon Abdhur Rassad Khan   | ... | ... | 1911  |
| Surgeon-Major C. Banks                 | ... | ... | 1911  |
| Hon. Major L. A. H. Clerke             | ... | ... | 1913  |
| Asst. Surgeon C. G. Crow               | ... | ... | 1916  |
| Asst. Surgeon G. A. Deane              | ... | ... | 1911  |
| Lieut.-Colonel F. J. Dewes             | ... | ... | 1909  |
| Hon. Lieut. J. F. Fleming              | ... | ... | 1916  |
| Lieut.-Colonel J. W. Grant             | ... | ... | 1900  |
| Sub-Asst. Surgeon Ihsan Ali            | ... | ... | 1911  |
| Asst. Surgeon C. C. Kelly              | ... | ... | 1916  |
| Major R. W. Knox (D.S.O.)              | ... | ... | 1909  |
| Hon. Lieut. J. J. McDonald             | ... | ... | 1914  |
| Lieut.-Colonel J. N. Macleod (C.I.E.)  | ... | ... | 1901  |
| Lieut.-Colonel R. H. Maddox            | ... | ... | 1902  |
| Sub-Asst. Surgeon Makkan Singh         | ... | ... | 1913  |
| Sub-Asst. Surgeon Muhammad Khan        | ... | ... | 1914  |
| Hon. Lieut. E. J. Murphy               | ... | ... | ..... |
| Sub-Asst. Surgeon N. Das               | ... | ... | 1911  |
| Hon. Capt. C. H. Orman                 | ... | ... | 1911  |
| Hon. Capt. R. J. Owen                  | ... | ... | 1906  |
| Lieut.-Colonel C. T. Peters            | ... | ... | 1913  |
| Major-General W. H. B. Robinson (C.B.) | ... | ... | 1901  |
| Lieut.-Colonel D. W. Scotland          | ... | ... | 1900  |
| Sub-Asst. Surgeon Shaik Ali Shubash    | ... | ... | 1911  |
| Surgn.-General W. H. Stevenson         | ... | ... | 1900  |

## FOREIGN ORDERS.

|                             |     |                                       |     |
|-----------------------------|-----|---------------------------------------|-----|
| Lieut.-Colonel W. R. Battye | ... | Legion of Honour (D.S.O.)             | ... |
| Major R. J. Bradley         | ... | White Eagle, Serbia.                  | ... |
| Capt. S. R. Douglas         | ... | Ordre de Couronne Officier (Belgium). | ... |
| Major H. Falk               | ... | White Eagle, Serbia.                  | ... |

|   |     |  |     |
|---|-----|--|-----|
| Lieut.-Colonel A. B. Fry (D.S.O.)                     | ... | Legion of Honour (Croix.)                            | ... |
| Major A. C. Godson                                    | ... | Silver Medal for Military Valour, Italy.             | ... |
| Capt. E. S. Goss (M.C.)                               | ... | White Eagle, Serbia.                                 | ... |
| Capt. V. B. Green                                     | ... | (1) White Eagle, Serbia, (2) Leg. of Honour (Croix.) | ... |
| Tempy. Lieut.-Colonel (Major) W. H. Hamilton (D.S.O.) | ... | Order of the Crown of Italy.                         | ... |
| Capt. J. W. Hny                                       | ... | Croix de Guerre.                                     | ... |
| Lieut. N. S. Jatar                                    | ... | White Eagle, Serbia.                                 | ... |
| Lieut. R. N. Kapadia                                  | ... | Croix de Guerre.                                     | ... |
| Lieut.-Colonel P. P. Kilkelly                         | ... | Brilliant Star of Zanzibar.                          | ... |
| Lieut.-Colonel R. W. Knox                             | ... | White Eagle, Serbia. (D.S.O., K-I-H.)                | ... |
| Capt. J. B. Lapsley                                   | ... | Croix de Guerre.                                     | ... |
| Lieut.-Colonel C. W. Owen                             | ... | Hurmat (Afghan). (C.M.G., C.I.E.)                    | ... |
| Major W. C. Paton (M.C.)                              | ... | White Eagle, Serbia.                                 | ... |
| Capt. J. A. Sinton (V.C.)                             | ... | Order of St. George, Russia.                         | ... |
| Lieut.-Colonel W. H. Tucker                           | ... | Legion of Honour (K-I-H.)                            | ... |
| Major M. J. White                                     | ... | Croix de Guerre.                                     | ... |

## Current Topics.

## "TWENTY YEARS AFTER."

The Governor-General in Council is pleased to direct the publication of the following Royal Warrant, dated the 5th June 1918, amending the Royal Warrant, dated 28th May, 1913 regarding promotion and precedence in the Indian Medical Service, which was published in Army Department Notification No 558, dated the 27th June, 1913:—  
GEORGE R. I.

Whereas we deem it expedient to alter the rank and titles of the Surgeon-Generals of Our Indian Medical Service:

Our Will and Pleasure is that Surgeon-Generals ranking as Lieutenant-Generals shall be granted the rank and title of Lieutenant-General, and that Surgeon-Generals ranking as Major-Generals shall be granted the rank and title of Major-General.

Our Warrant, dated 28th May, 1913, for the promotion and precedence of Our Indian Medical Service, shall be amended accordingly.

Given at Our Court at St. James', this 5th day of June 1918, in the eighth year of Our Reign.

It is just twenty years ago that the Royal Warrant dated India Office 26th August, 1898, was issued which conferred on the I. M. S. officers the combatant titles which had been granted to the R. A. M. C. a few months before. In that warrant it was stated that "officers above the rank of Surgeon-Colonel shall in future be Surgeon-Generals [not Surgeons-General], ranking as Major-Generals, and the titles of Surgeon Major-Generals now serving shall be altered accordingly." A few years later in the Royal Warrant, dated 28th June, 1905, it was ordered that the rank of Lieutenant-General may be conferred on the Director-General of the I. M. S., and this has been repeated in more recent issues of the Royal Warrant, and was acted upon in the case of the late Sir Pardey Lukis.



This brings to a satisfactory end a long continued dispute, though the "rank question," as it used to be called, was practically settled by the issue of the Royal Warrant of 1898.

Commissioned rank was first formally conferred on the Company's Medical Officers by Lord Cornwallis in 1788, but the old titles of "Physician General" (*sic*) and "Chyrurgian General" are met with in correspondence in India as long ago as October, 1677 (Crawford's *Hist., I.M.S.*, Vol. I, p. 297). In 1763 the Bengal Medical Service was constituted and included three ranks. *viz.*—Head Surgeons, Surgeons, and Surgeon's Mates; but the title of Surgeon-General was used at certain times, thus in 1784 we find the strength of the Medical Department, Madras, given as one Surgeon-General, two Surgeon-Majors, 27 "other" Surgeons, and 20 Assistant-Surgeons." The title has varied, but from the foundation of the service in 1763, and even earlier, there has always been an administrative grade with powers of control over the executive ranks. The titles have varied—being Head Surgeon, Superintending Surgeon, Deputy Inspector-General, Deputy Surgeon-General, Surgeon-General, Surgeon-Colonel, Colonel, Surgeon-Major General, and now simply Colonel, Major-General or Lieut.-General.

For the complicated story of the fight for relative rank, we refer to Lieut.-Colonel D. G. Crawford's *History of the Indian Medical Service*,\* a book which should be in the possession of every member of that old and oft-threatened establishment.

#### ASYLUMS IN INDIA.

THE Asylum department has long been recognised to be the Cinderella of all Government Departments, and as the years pass things do not seem to improve. Some years ago modern asylums were built at Lahore and at Agra, but nothing except patchwork repairs and "extensions" have followed since. In 1905 the then recently enlarged and decidedly obsolete asylum at Berhampore was condemned and a project was started to build a modern, up-to-date Mental Hospital at Ranchi for the then Province of Bengal. Committees met, plans were discussed and approved, but still nothing was done. In time came the territorial changes in Bengal; Ranchi, the place chosen for the new up-to-date asylum, went over to the new Province of Bihar and Orissa. The proposal, however, continued to have an existence in the Secretariat files, and up till a few months ago it was seriously believed that the long-deferred scheme of a big asylum at Ranchi would some day see the light. Then came financial

stress; the scheme has been abandoned owing, we presume, to financial stress, and Bihar and Orissa remains with a very old obsolete and crowded asylum at Patna for a few hundred lunatics, and Bengal has to content itself with a badly planned crowded asylum at Berhampore and a worse one at Dacca.

In the provinces of Bengal and Bihar and Orissa there are about 88 million people; the Census Report for 1911 puts down the number of persons reckoned, for census purposes, as insane to be 30,675, and for the treatment of these the total asylum accommodation in the two provinces is less than 2,000, or 1/15th of the total number returned as "insane."

In the Annual Reports we find year after year the same complaint. In the last report on the Burma Asylums, overcrowding is the theme and the 35-lakh scheme for a new asylum is shelved, "meantime extra accommodation is being provided" in the Rangoon Asylum, and the Government Resolution remarks:—

"The disadvantages of inadequate accommodation: This inadequacy is felt most severely in respect of the provision of facilities for employment and recreation. The inmates should be permitted as far as possible to live an open-air life and to follow the occupations and amusements to which they have been accustomed before they entered the asylum. Want of space prevents this method from being followed at present, but it is hoped that the plans for the new asylum will provide opportunities for the suitable employment and recreation of the inmates."

Overcrowding, too, is the theme of the Bengal Report, and extra accommodation is to be crowded into the Dacca site.

Since the date of the report the hope of relief, by a new asylum at Ranchi, has gone.

One and only one improvement is to be recorded. The European lunatics at the old asylum at Bhowanipore, Calcutta, have been moved to the newly opened European Asylum at Ranchi—which alone of the ambitious Ranchi schemes has survived and matured.

It is proposed *at once* to build a modern block for mental cases on the site of the old asylum in Calcutta and that it should be done soon is obvious from the following extract from the report by the Surgeon-General, Bengal:—

"Last year the European Association raised the question of the accommodation and treatment of cases of *Delirium Tremens* amongst the Europeans and Anglo-Indians residing in Calcutta. The Association complained that the hospitals generally refused admission to such cases, and that great difficulties were experienced in the absence of definite orders in the matter. *Delirium Tremens* being a form of insanity, my predecessor, Surgeon-General Edwards, decided that such cases should be taken to the Bhowanipore Lunatic Asylum, on a written order previously obtained from the Commissioner of Police for their admission as non-certified 'under observation' cases. The Association

\* London, 1913, Thacker & Co.; Calcutta, Thacker, Spink & Co., 2 Vols.

was not, however, satisfied with this decision as they said 'it involved unnecessary hardship on the patient and his friends and saddled the person for the rest of his life with the additional stigma of being a lunatic.' In order to satisfy the Association, arrangements have been made, with the approval of Government, for the reception and treatment of such cases in the Presidency General Hospital."

For all others, under observation for mental disease, there remains only the jail cell.

### THE USE OF QUININE.

THE following practical note by Major A. MacGilechrist, I.M.S., has been circulated to certain Military hospitals and is well worth reproducing here:—

"Quinine *by mouth* should be the routine method of treating malaria: very few patients indeed require this remedy to be administered by any other method.

In order to obtain the best results when giving quinine by the mouth, it is necessary to keep in memory certain facts. Strong solutions of quinine are very irritating, sometimes even caustic: care should therefore be taken that a concentrated solution of quinine never exists in the stomach. It is, thus, bad practice to let a patient swallow two or three tablets of a very soluble salt, such as the bihydrochloride, on an empty stomach, for instance, in the early morning. As regards absorption there is little or no advantage in great solubility of the quinine salt when giving quinine by the mouth, because very little quinine is absorbed from the stomach. Quinine sulphate is as good as any other salt for oral administration and not being very soluble cannot cause much irritation. Gastric irritation is also effectually avoided if quinine is taken *towards the end of or soon after meals*.

Quinine is absorbed mainly from the small intestines and absorption is slow. As the solution of quinine salt enters the duodenum, the alkaloid (quinine) is precipitated by the alkaline secretions of the pancreas. Quinine alkaloid, however, is very soluble in bile and in practice cholagogues are found to assist greatly the absorption of quinine. As absorption is very slow, the contents of the intestines must not be hurried along too rapidly: active purgation—apart from an *initial* cholagogue purge—must be avoided.

These are the essential points to be borne in mind when giving quinine by the mouth and they are excellently met in the composition of Warburg's tincture, the efficacy of which is well known. Warburg's tincture contains several cholagogues and, as these are purgative, their purgative action is counteracted by substances such as opium, which it also contains.

*Preliminary purgation with calomel is good.* Some follow up the calomel with a dose of magnesium sulphate, but this does harm by washing all bile out of the intestines.

*Quinine for prophylactic purposes is best given after the evening meal:* its physiological effects (buzzing in ears, etc.) are then produced during sleep and do not inconvenience the men.

In all pernicious cases of malaria, where *rapidity of action* is important, e.g., cerebral or comatose cases, quinine should be administered *intravenously*. The usual dose is about  $\frac{1}{2}$  gramme ( $7\frac{1}{2}$  grains) dissolved in *two or three pints* of normal saline; and the salt generally employed is either the hydrochloride or bihydrochloride.

Intravenous saline infusions are now carried out so frequently in the treatment of cholera that the sub-assistant surgeons are proficient in this method of administration.

Quinine powder and tablets, and still more so solutions, if at all old, often show mouldy growths. It is advisable therefore to boil the quinine in a little saline for a few minutes in a test-tube before adding it to the sterile saline for infusion.

There are—still—other cases of malaria, chiefly of the *abdominal type*, where on account of gastro-intestinal disturbances (vomiting, diarrhoea, and dysentery) quinine given by the mouth cannot be retained or absorbed, where rapidity of action is not so urgent as to justify intravenous injection and where quinine given *per rectum* cannot be retained. In such cases *subcutaneous or intramuscular* injections of quinine would solve the difficulty if such injections carried with them the assurance that (1) quinine was absorbed well and (2) there were no dangers other than those associated with similar injections of such substances as morphin.

There is definite proof, clinical and experimental, that when a concentrated solution of a quinine salt (e.g., 5 or 10 grains in a 30-minim syringe) is injected intramuscularly or subcutaneously (1) most of the quinine is precipitated at the site of injection and remains there for at least many hours and (2) the tissues at the seat of injection are killed (necrosed), giving rise to so-called 'abscesses' and fibrous nodules and, if the injection is made superficial enough, to sloughing and ulceration.

There is also definite proof, clinical and experimental, that, if quinine is injected in great dilution, absorption of quinine is rapid and complete. Further, according to Dr. James, who has used extensively in the Panama Canal Zone this method of injecting dilute solutions (1-15) of quinine, no ulceration or other ill-effect has been observed although the injections were made into the subcutaneous tissues.

No one contends that no quinine whatever is absorbed from an injection of a concentrated solution of quinine; but there is definite evidence that the patient gets the benefit of very little of the dose of quinine, thus injected, that he has to suffer considerable local damage to his tissues, and that he has to undergo the risk of certain other complications—tetanus, painful nodules, etc.

The *minimum* therapeutic dose of quinine is exceedingly small: for benign tertian injection it is about 0.1 gramme thrice daily for an adult weighing 11 stone; for malignant tertian, about 0.15 gramme; and for quartan, about 0.2 gramme (3 grains). The corresponding hypodermic dose of quinine, if quinine were completely and rapidly absorbed, would be less than one grain (one-third of oral dose). That some good may result if two or three grains of quinine are absorbed when ten grains of quinine are injected in a concentrated solution is therefore easily understood. But—how much better to inject five grains of quinine with a 10 c.c. syringe (dilution about 1 in 34) and have all five grains rapidly absorbed and the tissues at seat of injection uninjured than to inject 10 grains of quinine with a 30-minim syringe (dilution about 1 in 3) and have 3 grains of quinine absorbed in the first 24 hours, the tissues, at the site of injection seriously damaged, and the risk of complications and sequelæ owing to the prolonged presence of damaged tissues?

Dr. James (Panama), using a large syringe, injects  $1\frac{1}{2}$  grammes ( $22\frac{1}{2}$  grains) of quinine bihydrochloride dissolved in 20 c.c. of normal saline *deeply* into the subcutaneous tissues. *A still more dilute solution is to be recommended* and this can easily be obtained because Dr. James's dose is unnecessarily large. Five grains of

quinine in 10 c.c. of normal saline gives a dilution of about 1 in 34, and a 10 c.c. syringe is usually at hand. This injection may be made deeply in the subcutaneous tissues, following James's method, or *intramuscularly*; and it may be repeated as often as desired, but one should revert as soon as possible to oral administration. Massage at the site of injection increases the dilution of quinine still more and promotes absorption: injection at two or more places has the same effect.

*Clinical indications.*—As already stated, the main use for subcutaneous and intramuscular injections of quinine is in cases of malaria of the *abdominal type*, where quinine cannot be retained and where there is not sufficient urgency to justify intravenous injection.

There are also certain *chronic* cases of malaria—some exhibiting *persistent low fever*, others characterised by *frequent relapses of fever* (about every two weeks)—in which this method of administration is occasionally successful when quinine by mouth has been ineffective. In such cases the desired effect is attained not by more quinine being absorbed but by the psychic effect upon the patients who are "run down": any procedure (hypodermic injections, tonics, change of air, etc.) which raises the patients' hopes, spirits and vital forces, helps quinine.

*Technique.*—A large serum syringe should be used instead of a small minim one. The quinine solution should be freshly prepared because solutions of this substance are apt to get mouldy in a few days; it should be boiled carefully for a few minutes and injected while still warm. Ordinary surgical precautions should be taken as regards syringe, needle, and skin of patient. The deltoid and gluteal regions are the favourite sites for intramuscular injections: large nerves and blood-vessels must be avoided. It must always be borne in mind that the greater the dilution of quinine in the solution, the better the absorption of quinine, the less the damage to tissues at site of injection, and the less the risk of such complications as tender nodes, sloughing, ulceration, necrosis, thrombosis, paresis and tetanus.

*Dose.*—The dose should be from 5 to 10 grains: seldom should more than 10 grains be required if given sufficiently dilute so as to ensure complete absorption. If the dose is increased above this and dilution diminished, the result is precipitation of quinine locally, less quinine absorbed, greater damage to tissues locally and greater risk of complications. Therefore give small doses, e.g., 5 grains, well diluted and repeat when necessary. If given in a dilution of about 1 in 40, quinine hydrochloride may be used instead of the bi-hydrochloride and has the advantage of being a neutral salt. Just as the sulphate by virtue of its low solubility is preferable for oral administration and can cause little gastric irritation, so the hydrochloride on account of its comparatively low solubility is preferable to the bi-hydrochloride for subcutaneous and intramuscular injections and is less likely to produce complications."

#### THE ROCKEFELLER FOUNDATION.

We have received a pamphlet which admirably reviews the world-wide activities of this celebrated Foundation—written by Mr. George E. Vincent, President.

The book value of the funds of this Foundation is estimated at 120 million dollars or, say, 25 millions sterling.

The disbursements are on a big scale, thus the Foundation appropriated £1,000,000 sterling to the American Red Cross.

"The well-being of Mankind throughout the World" is the motto of the Foundation, and as this depends on us winning the war, we naturally find the Foundation devoting huge sums to war work, and the Training Camps are the result. A war demonstration hospital (to illustrate the Carrel-Dakin methods in surgery), a Serum Institute, a hospital for war mental cases, are some of the many sides of the Foundation's activities.

The after-care of the victims of infantile paralysis (poliomyelitis) and a new anti-tubercle campaign in France are other works of the Foundation. It has also built and furnished a magnificent School of Hygiene as part of the Johns Hopkin's University.

The note gives an account of the widespread anti-hookworm campaigns of the Foundation. Work against yellow fever is continued, but the war has postponed Colonel Gorgas' campaign, intended for 1917, for "ridding the world of yellow fever." A huge floating dispensary, a ship of 300 tons, is at work among the numerous islands of the Phillipines. Medical education in China, has been largely subsidised, and the new Pekin Union Medical College is being built and another is contemplated at Shanghai.

We may quote the final para. of this interesting report:—

"When at last peace comes, it cannot quickly bring universal confidence and good-will. There may be years of suspicion and bitterness, of misunderstanding and recrimination; there is sure to be keen industrial and commercial competition. Is it too much to hope that such work as the Foundation is doing in many parts of the world may tend at least to emphasize the common interests of mankind in turning science from the destruction to the healing and the happiness of men?"

#### SANITARY PAMPHLETS.

We have received a packet of pamphlets on many sanitary subjects by Rao Sahib U. Rama Rau, a Madras medical practitioner (published by Sri Krishna Bros., Madras).

They belong to a health lecture series and are practical and useful. The chief subjects dealt with are as follows:—School Hygiene; Water and Health; Air in relation to Health; Health and Disease; Common Disease-carrying Insects; Houses and Health; Milk and Health; Preventable Diseases; and What to do before the Doctor arrives.

They are all well written and generally clearly expressed, and should be of value if read by lay people, to whom they are addressed.

We commend the series to the notice of our readers and hope these little practical pamphlets will enjoy a very wide circulation.

#### THE RESEARCH DEFENCE SOCIETY.

WE have received the report of this Society for the year 1917-18 which is, as usual, of interest. The Union of the Association, for the Advancement of Learning by Research with the Research Defence Society, has worked well. We need only remind our readers that the address of the Secretary of this Society, Mr. Stephen Paget, F.R.C.S., is 21, Ladbroke Square, London, W. 11, and those I. M. S. officers who have not yet put down their names as subscribers should at once send their guinea to the above address. We may here quote the last paragraph of the Report:—

"Doubtless, in the years which are ahead, the anti-vivisection societies, now more or less dormant, will try to recover some of the ground which they have lost during the ten years of our Society's work. But it is not easy to believe that they will recover more than a very small part of it. For example, it is not easy to believe they will have, after the War, that following in the House of Commons which they had before the War. Neither is it easy to believe that they will soon be able again to fill the columns of great newspapers with long letters, long reports of their meetings, and long advertisements. These things they could do before the War, but not now. The country will be up against problems so difficult and perils so cruel that it will not care for 'burning questions' which do not really burn, and are indeed burned out. For it is certain that the War has loudly borne evidence against anti-vivisection, strong evidence, given as it were with a touch of angry contempt. The War has made it plain to all, that without knowledge gained from experiments on animals, thousands and tens of thousands of lives, which have been safeguarded or saved, would have been lost. And, what is more, among those who are busily employed in this good work, are many whom the anti-vivisection societies assail with much abuse. We can trust the public to judge between these men and those societies. And there is one more thing to be remembered. The country is more awake than it used to be to the value of scientific method, and to the value of education. Our Society stands for these: and the anti-vivisection societies, on the whole, stand against them. So we can look forward without anxiety to what the public will think of us and our objects in the years which are ahead."

THE first issue of the new *Medical Journal of the Siamese Red Cross* has been received. The Editorial Committee consists of Dr. L. Roberts and Dr. H. Campbell Highett. It is written in Siamese as well as in English.

Dr. Campbell Highett (P.M.O.) has an article in both languages on the treatment of trachoma by carbonic snow, applied on the form of a pencil. There are other articles in French.

PROCEEDINGS of a condolence meeting of the staff and students of the Agra Medical School held on 1st August,

1918, under the presidentship of Lieutenant-Colonel G. Hutcheson, M.B., I.M.S., principal of the school, at the sad and premature demise of Dr. Chandra Mohan De, Rai Bahadur, lecturer of ophthalmic surgery, Medical School, Agra.

On the president taking his seat Dr. B. K. De, lecturer of anatomy, with the president's permission, read a short narrative of the late Dr. C. M. De's life.

#### RESOLUTION (put from the chair):

That the staff and students of the Agra Medical School, past and present, assembled in a meeting express their sense of extreme regret at the sad and premature death of the late Dr. Chandra Mohan De, Rai Bahadur, who held lecturership of ophthalmic surgery in Agra Medical School for fifteen years.

Passed unanimously, all standing in solemn silence.

As a result of the War, and the paper shortage, our able contemporary, *The Practitioner*, appears, in the May issue, on thinner paper and in smaller type. We recognise this as unavoidable, but one does miss the fine big print which made the pages of *The Practitioner* so pleasant to read. It has now reached its 50th year of existence; as we are a few years older we may be allowed to congratulate it.

### Reviews.

**Field Hygiene and Sanitation.**—By COLONEL J. H. FORD, M.D., Medical Corps, U. S. Army. London: WM. HEINEMANN, 1918. Price 6s. net.

THIS is an admirable little book, cram-full of practical information from first page to last. It is written mainly for use in the American Army now in France, and compares favourably with Lelean's similar book for the British Army.

Such a book must necessarily follow familiar lines, and the chapters are thus divided: general considerations; personal hygiene; the march; camps; water; messing of troops; camp diseases; and illustrative regulations.

The book is very well illustrated; it is well printed and is handy. We can strongly recommend this little book. The medical officer in India will find many points of interest. It is a sound, reliable book.

**Aids to Analysis of Food and Drugs.**—By C. G. MOOR and W. PARTRIDGE. Fourth Edition. London: Baillière, Tindall & Cox. Price 4s. 6d.

IN this book, in a compact form, a huge amount of information is packed on the subjects of the analysis of food and "such drugs as are commonly sold to the public."

The war and food restriction has led to many changes and increased the importance of this branch of the public health. A synopsis of orders of the Ministry of Food is usefully appended.

The chapter on examination of oils and fats is particularly good and detailed. There is a useful note of the once despised *Margarine*, and it is said that, "when carefully prepared and coloured, it is not easy to tell margarine from butter by taste or smell;" and in the *Journal of Physiology* (March, 1917) Halliburton found "oleo margarine as satisfying as butter for the nutritive requirements of young children," but it must be good and contain "beef fats."

The little book is an excellent one and can be well recommended to students.

**The Internal Secretions.**—By E. GLÉY, M.D., of Paris. Translated by M. FISHBERG, M.D., of New York. London: Wm. HEINEMANN, 1916.

THIS book is rightly believed to fill a gap in our literature, as books on the physiology and pathology of the endocrine glands are but few.

The book consists of three sections or chapters: on the concept of internal secretions and their developments; the distinctive characteristics of the internal secretory glands; and the principal products of their activities and the function of these glands.

We can recommend the book to any one wanting to read up modern views on the endocrine glands and their functions, and Dr. Fishberg has done well to translate it from the French.

## SPECIAL ARTICLE.

### HEIGHTS AND WEIGHTS.

#### A HELP TO RECRUITING OFFICERS.

IN every country from time to time endeavours have been made to devise formulæ to correlate height, weight and chest girth, and those who are old enough to remember Dr. Aitken's lectures at Netley, 30 years ago, will know how he laboured at what he called the "physical equivalents" of the "growing lad" or recruit.

Tables of the relation between height and weight are now common in many countries, and if reasonably used are certainly helpful. It is not that a youth, a man, or woman, of a certain height must closely conform to the weight tabulated, a margin of 15 or 20 per cent. on either

side is allowable. Such a table is undoubtedly useful in comparing the recruits or the prisoners it may be of one year (say after a famine) with those of previous years. The table lays down a standard, and the men examined in any one year may be above or below it in a greater or less degree than in another year. Such a fact is certain, and may be of very considerable importance.

The first table for such physical equivalents in use, or rather published in India, was one published in these columns in 1897 by Sir Walter (then Captain W. J.) Buchanan and now known in the text-books (e.g., Waddell-Lyon's *Medical Jurisprudence*) as "Buchanan's formula." This formula was the result of an examination of 27,000 heights and weights of adult male prisoners of South Bihar. It was found that the results of an examination of this large number of prisoners closely corresponded to a table founded on smaller numbers made by Dr. Jackson, when Superintendent of the Central Jail at Buxar.

When Jackson's table and Buchanan's were compared, it was found that they were largely identical, and that the larger number of cases examined confirmed the smaller. On this table, therefore, "Buchanan's formula" was founded—which is to the effect that taking 5 feet of height to have a weight of 100 lb., for each inch over 5 feet 3 lb. of weight should be added (for slight modification see below), e.g., 5 feet 3 inches = 109 lb.

This table was submitted to very considerable criticism when published, especially in the Punjab, though no one ever dreamt that a table prepared for Biharis would suit the much bigger wheat-eating men of the Punjab. It was, however, found, on the other hand, to be remarkably accurate (or sufficiently accurate) for the prisoner class in the Central Provinces [as was shown by Captain (now Lieutenant-Colonel) Andrew Buchanan, I.M.S.].

The military value of such a table has never been lost sight of, and in all countries such tables or formulæ have been devised. Some five or six years ago, Colonel R. H. Firth, of the Royal Army Medical Corps, published officially a useful note on "The Physique of Recruits for the Indian Army."

The material examined was made up of 5,676 sepoy of the Indian Army—Sikhs, Pathans, Hazaras, Baluchis, Punjabis, Hindustanis, Mah-rattas, Dogras, Gurkhas and Madrasis, a very heterogeneous collection. It was not strange that out of such a varied collection Colonel Firth was unable to devise any formulation which would be of great value. He, however, remarked that "the data, however, do justify the formation of a general rule for guidance of medical and recruiting



officers. The rule runs as follows:—"Taking 5 feet in height as equivalent to 100 lb. in weight, for every inch above 5 feet add 3 lb. This rule as given is applicable to all classes. It is easy on the Ghuzni Pathan and Baluchi, Sikh or Punjabi, in whom a rate of  $3\frac{1}{2}$  to 4 lb. for each inch above 5 feet would work out very well."

This is in fact the "Buchanan formula" published in these columns 15 years before. Colonel Firth nowhere refers to the previous enunciation of this formula (and its foundation on a much larger and more homogeneous body of persons), so that if he arrived at it independently, it only goes far to substantiate the general truth and usefulness of the "Buchanan formula."

We have not, however, taken up this question with a view to settle the minor matter of priority, but because in the *China Medical Journal* (May, 1918, p. 210) there is an excellent article by Dr. Duncan White of Swatow on the results of a report of a Research Committee appointed to examine the height, weight and chest measurements of healthy Chinese, about 2,086 in all. Of these 1,741 were healthy male adults and the "average" height is found to be 5 feet 4 inches (163 centimetres).

We shall now quote the article itself:—

While many of these findings with regard to the height of Chinese of both sexes are strictly what we would expect in any race—such as boys being taller than girls after the age of puberty, and men being taller than women—yet beyond this it has to be emphasised that the Southern Chinese, whether boys or girls, men or women, do not attain to the European standards for height.

The question of weight is of considerably more importance to the medical man than the question of height, and the result of the present study confirms previous findings that the Southern Chinese and, so far as statistics are available, the Northern Chinese, also, weigh much less than Europeans and Americans of the same height.

What is perhaps the most important point with regard to the "average weight" is its bearing on the dosage of drugs. The dose recommended in the home pharmacopœias for any particular drug is calculated on the hypothesis that the adult dose will be administered to an individual weighing about 150 lb. (say 70 kilos.) In view of the fact that the average Southern Chinaman is about one-fifth lighter than this, careful watch should be kept when maximum doses of dangerous drugs are being administered.

The weight of an adult depends partly upon his age but much more upon his height, and it is of little value to say that the average weight of a male adult in South China is 119 lb. (54 kilogrammes), unless we know the average height of the people and what figure should be added to or subtracted from this average weight for every inch or centimetre above or below the average height.

For statistical purposes it is much more convenient to state a person's weight not absolutely as so many pounds, but relatively as so many ounces for each inch of stature (or so many grammes for each centimetre if the metric system be preferred). Such a figure, obtained by dividing the total weight by the number of inches or centimetres

of height, may well be used for making comparisons between different classes of individuals, and may be referred to as the "Weight for Height Index."

In England this index varies between 36 and 40 or even 48 ounces for every inch of stature (or 402 gms. to 447 gms. or even 536 gms. for every centimetre); that is to say, a man who is 64 inches high should weigh not less than 64 times 36 ounces = 2,304 oz. = 144 lb. (Or height 162.5 cms., weight =  $162.5 \times 402$  gms. = 65.3 kilos.) In South China the index varies between 26 oz. per inch (205 gms. per cm.) in Tungkun to 30 oz. (335 gms. per cm.) near Swatow, while the average for the few cases from Chekiang is also 30 oz. All these figures are far below the European standard of 36 to 40 oz. per inch (402 to 447 gms. per cm.).

To put these facts in another way: While we know that the minimum weight of an Englishman of 5 ft. 4 ins. (162.5 cm.) is 144 lb. (65.3 kilos.), we find that the average weight of a native of this height from Chekiang or Swatow is only 120 lb. (54.4 kilos.) and the average native of Tungkun of the same height only weighs 104 lb. (47.2 kilos.).

Similar differences exist in the case of women between the standard weight for height index in European countries and the figures obtained in Southern and Central China: 30 to 32 oz. (335 to 357 gms. per cm.) is the home standard, while the averages for South and Central China are 24 oz. (270 gms. per cm.) and 30 oz. (335 gms. per cm.) respectively. It will be seen that the average for Central China only reaches the English minimum figure.

We cannot but feel that the great difference between the standard figures given in foreign textbooks and the true standards for China is so important as to justify all the effort that has been made by the Research Committee and its collaborators to secure the preparation of true standards for China.

Whether a doctor is examining a candidate for life insurance or is trying to determine the prognosis in a case of tuberculosis, it is equally important he should know what a healthy person of the age and height of the individual being examined ought to weigh. If he expected a Chinaman to conform to the standards laid down in European and American textbooks, he would be very seriously misled.

Before going on to consider the weight for height index for young people it may be well to consider the best way to discover the standard weight for any particular individual in South China. It is obvious that one method is to multiply his height in inches by the weight for height index (i.e., 26) and call the result ounces, but as this necessitates dividing the result by 16 in order to get the number of pounds weight, it is somewhat troublesome to use.

Another and simpler method, which has been found to work accurately in Swatow, is to deduct 24 from the number of inches representing the height and multiply the result by 3. This gives the number of pounds that the individual should weigh.

Example:—Height 5 ft. 5 ins. = 65 inches; deduct 24; = 41; multiply by 3; = 123 lb. weight.

In other parts of China where the weight for height index is lower than in Swatow, 27 instead of 24 should be deducted before multiplying by 3. Whatever method of determining the standard weight be employed, one must remember that variations within 15 per cent. above and below the standard figure may be considered as "normal."

Broca's rule for estimating the proper weight of a European is to deduct 100 from his height in centimetres and call the remainder kilogrammes. This is a very simple rule but cannot be applied to the natives of South China until the remainder has been diminished by 20 per cent. When modified in this way Broca's rule has been found a very reliable guide.

## PIGNET'S FACTOR.

Another method is in use in the French and other armies; there it is known as *Pignet's Factor of Physical Fitness* (vide Col. Firth's Note above quoted), who writes:—

The observations to which I refer relate to what is known as Pignet's Factor of Physical Fitness. Pignet is a French military surgeon, and he found the following formula applicable to the appraisalment of physical fitness for service among French soldiers. The formula stands as  $F = H - (C + W)$ . Here  $F$  is the factor,  $H$  is the height in centimetres,  $C$  is the measurement in centimetres of the chest on full expiration, and  $W$  is the weight in kilogrammes. Pignet arranged the factor or figure so obtained in the following scale:—

If the factor be less than 10, the man to be classed as Very Strong.

|               |         |            |
|---------------|---------|------------|
| between 10—15 | classed | Strong.    |
| " 15—20       | "       | Good.      |
| " 20—25       | "       | Moderate.  |
| " 25—30       | "       | Weak.      |
| " 30—35       | "       | Very Weak. |
| Over 35       | "       | Useless.   |

In other words, the smaller the factor the finer the physique of the man. In very well developed individuals, the factor would become a negative quantity. Thus, we find a man 5 feet 1 inch in height, with a weight of 145 pounds and a minimum chest measurement of 36 inches gives a factor of—3; similarly, a man of 5 feet 5 inches, weight of 139 pounds and a minimum chest girth of 37 inches gives a factor of 6; another man of 5 feet 3 inches, a minimum chest girth of 34 inches and a weight of 122 pounds gives a factor of 18; while a man of 5 feet 9 inches, with a chest girth of 32 inches and weight of 119 pounds gives a factor of 40. It is obvious that the short, stout or sturdy type of man will on this scale give the lowest range of factor, while the tall, lean man will give a correspondingly high factor. We find all types in the material under review.

It will be seen therefore that there are several methods at the disposal of the medical officer for appraising fitness, viz.:—

## I. BUCHANAN'S FORMULA.

(Also suggested by Col. Firth.)

Taking 100 lb. as equivalent to 5 ft., add 3 lb. for every inch above 5 ft. up to 5 ft. 6 in., for over 5 ft. 6 in. add 4 lb. per inch of height—

Examples: 5 ft. 3 = 109 lb.  
5 ft. 7 = 128 lb.

## II. THE CHINESE FORMULA.

Deduct 24 from the number of inches of height and multiply the result by 3. This gives the number of pounds the individual should roughly weigh.

Example: 5 ft. 5 in. — 24 = 41  
Multiply by 3 = 123 lb. weight.

This is a bit in excess for Indian heights and weights, but if we deduct 27 in the cases of heights from 5 ft. to 5 ft. 6 in. and 24 in cases of heights over 5 ft. 6 in., we get approximately

the same weights as are obtained by the "Buchanan Formula," e.g.\*

| The Buchanan Formula. | Height.    | Inches (deduct 27). | The Chinese Formula |
|-----------------------|------------|---------------------|---------------------|
| 100                   | 5 ft. ...  | =60-27 = 33×3       | =99 lb.             |
| 109                   | 5 ,, 3 in. | =63-27 = 36×3       | =108 ,,             |
| 115                   | 5 ,, 5 ,,  | =65-27 = 38×3       | =114 ,,             |
| over 5 ft. 6 in.      |            | (deduct 24)         |                     |
| 128                   | 5 ,, 7 ,,  | =67-24 = 43×3       | =129 ,,             |
| 140                   | 5 ,, 10 ,, | =70-24 = 46×3       | =138 ,,             |

It will thus be seen that for Indian heights and weights of average adult males of the cultivator class in Bihar and in the Central Provinces (and according to Col. Firth) of the classes enlisted for the army "the Buchanan formula" stands good and may be used as a guide, or, if preferred, the Chinese formula, but of the two the earlier formula is the more easy to remember and to work, viz., add 3 lb. to 100 lb. weight for every inch above 5 ft. up to 5 ft. 6 in.; over that height add 4 lb. per in.; always remembering that the resulting figure is not absolute and a margin of 15 to 20 per cent. on either side is allowable. It is at any rate as near to accuracy as any similar table in the nature of things can be.

W. J. B.

## Medical Society.

## WAR HOSPITALS MEDICAL SOCIETY.

A MEETING of the Bombay War Hospitals Medical Society was held in the Freeman Thomas War Hospital on Thursday, 27th June, Colonel Beyts, A.M.S., in the chair. Major Frost, R.A.M.C., read a paper on gonorrhœa and its treatment. Major Frost in his paper gave a full account of the disease in all its aspects, and discussed in detail the various symptoms and complications. Regarding treatment, he laid stress on the possibility of aborting the disease by means of injections of 5 per cent. argyrol, the results of treatment being determined by the epithelium-pus ratio from the microscopical examination of the pus.

\* The following table is taken from *The Military Surgeon* (June, 1918), and is in use in recruiting for the American army:

| Height, inches. | Pounds. |
|-----------------|---------|
| 64 ...          | 120     |
| 65 ...          | 122     |
| 66 ...          | 124     |
| 67 ...          | 126     |
| 68 ...          | 129     |
| 69 ...          | 133     |
| 70 ...          | 135     |
| 71 ...          | 142     |
| 72 ...          | 149     |
| 73 ...          | 156     |

This ratio should also be used in all kinds of treatment as it affords a valuable guide to the progress of the case. Major Frost gave full details of the treatment of anterior and posterior urethritis, recommending for the former a solution of potassium permanganate—1 grain to the pint. In the latter, treatment with permanganate might advantageously be alternated with nitrate of silver, the irrigation-can being at a height of not more than 4 feet.

Regarding drug treatment, the lecturer considered these to be unsatisfactory. Ionic medication and mercurial injection give variable results. Urotropin was useful in cystitis and posterior urethritis where pain was present. Alkalis, iodine, and vaccine treatment had all been of doubtful value.

In the treatment of gonorrhœal complications, Major Frost laid great stress on the value of general treatment combined with other forms of treatment. In epididymitis, he advised vaccines followed by the Bier treatment, and in gonorrhœal rheumatism, vaccines, and in chronic cases, massage and splinting. The mechanical treatment of gonorrhœa with hot bougies or the suction method of Mills was mentioned. The lecturer closed with a few remarks on the treatment of stricture with special reference to forcible dilatation and on the tests to determine whether cure had been effected or not.

An interesting discussion followed. Colonel Sheen, A.M.S., considered that cases should be treated overseas, and not moved about too much. He was doubtful of the value of abortive treatment, but laid stress on the value of general treatment. Captain Moran, R.A.M.C., considered the test for cure too severe for war time, and believed that a modification of this would allow men to return to the front earlier.

Major Frost, in his reply, disagreed with Captain Moran in that an incomplete cure would result and complications would ensue. Colonel Beyts then thanked the lecturer for his interesting lecture, and the meeting dissolved.

## Correspondence.

### THE SYPHILITIC FACTOR IS SO-CALLED CHRONIC RHEUMATISM.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Twenty-five years ago when serving in Eastern Bengal, I was struck as other observers have been, by the number of men who had *gûls*—pieces of *nim* wood, shaped like a small cork—inserted into the outer side of the leg below the knee for the relief of *bûi* (chronic rheumatism). Not being a believer in chronic rheumatism, but convinced from other evidence of the widespread prevalence of syphilis in those districts, I regarded the cases as syphilitic, and after removal of the *gûls*, treated them accordingly, with marked benefit and relief of the pain. Recently, through the kindness of Lieutenant-Colonel W. D. Sutherland, M.D., I.M.S., Imperial Serologist, I have been able to put this belief to the test. Every case admitted into my wards with *gûls*, and several whom I have seen outside the hospital, whom he has also

kindly examined for me, gave a moderately or strongly positive Wassermann reaction, and lost their pains on being treated with mercury and iodide of potassium. It is not asserted that every patient who has a *gûl* in his leg is syphilitic, but it is maintained that the great majority are infected with the syphilitic virus.

MEDICAL COLLEGE,  
CALCUTTA.  
August, 1918.

Yours, etc.,  
J. T. CALVERT, M.B., F.R.C.S.,  
Lieutenant-Colonel, I. M. S.

### LEISHMANIA SORES AND ANTIMONY.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The following case may be of interest to your readers. An adult male who had been to Mesopotamia for a year and a half was seen on 11th February, 1918, with two oriental sores, on the face, of three months' duration. On 22nd February "Leishmania tropica" was seen from the scrapings under the microscope.

The patient was given intravenous injections of 4 per cent. solution of antimony tartarate in double distilled water as follows:—

|                     |     |     |         |
|---------------------|-----|-----|---------|
| 24th February, 1918 | ... | ... | 1 c.c.  |
| 28th February, 1918 | ... | ... | 1½ c.c. |
| 4th March, 1918     | ... | ... | 2 c.c.  |
| 8th March, 1918     | ... | ... | 2 c.c.  |
| 12th March, 1918    | ... | ... | 2½ c.c. |
| 20th March, 1918    | ... | ... | 2½ c.c. |

No reaction or any untoward symptom was noticed till 12th March, 1918; patient began to keep up temperature since 12th March, 1918, as per attached chart. No local symptoms were noticed. The injections were done under strict aseptic precautions; solutions were prepared each time afresh and no precipitate was noticed. Repeated blood examinations proved negative to any parasites. There was no evidence of syphilis and Wassermann reaction was negative. The temperature continued normal since 6th April, 1918.

The sores began to shrivel and dry up since the third injection and became quite soft. Patient was discharged cured on 10th May, 1918. The patient was seen by me two months after discharge and was in good health.

BOMBAY,  
17th August, 1918.

I remain, etc.,  
N. S. NARASIMHAN.

### WANTED A DIAGNOSIS.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Would any kindly disposed reader of the *Indian Medical Gazette* let me have his advice on the following case?

A. H., 4 years, firstborn boy, Mahomedan, parents healthy, no syphilis, no neuroses, had typhoid of over a month's duration. In November, 1916, child being averse from medicine and could not retain it if administered forcibly, sponging and enema, etc., brought him round. No tonics were given during and after convalescence. On 6th September, 1917, had a fainting fit, which was attributed to heat and crowd; a few drops of brandy brought him round; no fit of any kind after this and the child seemed to be in good health. On 17th February, 1918, he was circumcised, under chloroform, as a religious obligation only. Under chloroform child ceased breathing; artificial respiration brought him round and the operation was finished under partial anaesthesia; wound healed and stitches removed. On 8th March, 1918, i.e., three weeks after the operation, he got a fit more like an epileptic fit: ammon. brom., santonine and calomel administered but no worms passed; pea-cock broms. were given and he used to have fits every week or fortnight, generally after midday sleep or during the night; amyle nitrate didn't cut short the fits, which were nearly typical epileptic fits. The last severe fit was on the afternoon of 2nd July, 1918, since when given salol, 1 gr., pulv. ipecac. co., ½ gr., one powder after tea in the morning only; pot. brom., 2 grs., c. tinct. adonis vernalis, 2 ms.—one dose only at 10 A.M.; aurum brom., 1130th gr. in plenty of water at noon and at bed-time. This treatment gave him an unbroken sleep at night and no fits since 3rd July, 1918, but last night four abortive attempts at fits were made but no fits; this morning when taking tea after ricini oil he just dropped his head and was all right again. The child during this prolonged interval has been healthy, and generally tires out his playmates in running. I shall be highly grateful to any one giving me the line of treatment, prognosis, etc.

GOVIND RAJA,  
Sub-Assistant Surgeon.

## THERAPEUTIC NOTICES.

MESSRS. THE HOFFMAN LA ROCHE CHEMICAL WORKS, LTD., London, inform us that stocks of their well-known preparation THIOCOL ROCHE have arrived in India and are available to practitioners.

LAWRENCE & MAYO, of Calcutta, Bombay, Madras, Delhi and Rangoon, are the Agents in India for the X-Ray and Electro-Medical apparatus of Messrs. Newton & Wright, Ltd., of Wigmore Street, London.

MESSRS. K. V. DHENGLE & SONS, Bombay, send us a very complete catalogue of their various medical and surgical appliances and of their hospital furniture.

MESSRS. SMITH, STANSTREET & Co., Calcutta, are Agents for the Arsenobillon and Novarsenobillon, manufactured by Messrs. May & Baker, Ltd., Battersea S. W.

MESSRS. MARTIN & HARRIS call attention to the good repute of their ESCA SYRUP on all wasting diseases.

MESSRS. BUTTERWORTH & Co., Calcutta, have issued a book on the treatment *Kala-azar* by DR. MUIR, of Kalna, with a foreword by Sir Leonard Rogers.

## Service Notes.

## I. M. S. BADGE.

India Army Order No. 731, dated 20th August, 1918.

*Dress—British Officers.*—In supersession of the orders in (4463 Q. M. G.-S.A.) Indian Army Order No. 139 of 1918, the collar badge approved by His Majesty the King Emperor for wear by officers of the Indian Medical Service, is the badge which should be worn in full dress. The badge to be worn with the service dress will be of bronze.

2. The following is a revised description of the full and service dress badges:—

*On collar of tunic.*—Within two laurel branches (gold) a Star of eight points (silver) surmounted by a Garter (gold) bearing the motto of the order in letters of gold and enclosing an esculapius rod in silver, the whole surmounted by an Imperial Crown proper, underneath, on a scroll (silver), the words "Indian Medical Service."

*On collar of service dress jacket.*—As for tunic collar but in bronze.

3. Army Regulations, India, Volume VII, will be amended accordingly in due course.

THE casualties among officers reported during the fourteen days, 19th June to 2nd July inclusive, were 1,769, a number a good deal smaller than those recently reported, matters having been comparatively quiet on the British front. They may be tabulated as follows:—

|           |     |     |     |       |
|-----------|-----|-----|-----|-------|
| Killed    | ... | ... | ... | 378   |
| Died      | ... | ... | ... | 24    |
| Wounded   | ... | ... | ... | 960   |
| Missing   | ... | ... | ... | 254   |
| Prisoners | ... | ... | ... | 153   |
| TOTAL     |     |     |     | 1,769 |

The number of casualties among medical officers included in this list was also much smaller than those of recent lists, only 22. The names are given below. All, unless otherwise stated, are temporary officers of the R. A. M. C.

*Killed or died of wounds.*—Captain R. A. Preston, M.C. (R. A. M. C., regular); Lieutenant A. M. Clare.

*Died.*—Captains J. W. T. Boyd (Canadians), W. F. Hale (Canadians), D. T. O'Flynn, and W. J. H. Hepworth.

*Wounded.*—Majors C. W. M. Hope, A. E. P. McConnell, M.C. (T.F.), and R. H. Hodges, M.C. (S.R.); Captains J. W. McClery, G. W. Will, E. S. Meyers (Australians), C. G. Temploman (Australians), A. E. A. Buckhard, J. W. Darling, M.C., R. Craig, F. J. Miller (Australians), and A. Malseed, M.C.; Surgeon G. O. D. Ellis (R. N.)

*Missing.*—Captains J. M. Mackenzie, M.C., and F. C. H. Bennett.

*Prisoner of war.*—Captain A. H. Little.

Captain John Graham, Canadian Army Medical Corps, died on 11th May at a Canadian Red Cross Hospital in England, aged 56. He came from Canada in a battalion from Edmonton, and recently was in medical charge of Canadian railway troops.

Captain Richard Annys Preston, M.C., R.A.M.C., died on 7th June, 1918, of wounds received the same day, aged 27. He was the second son of the late A. E. Preston, M.L.C.E., and was educated at the London Hospital, taking the M. R. C. S. and L. R. C. P. London in 1914, and also graduating as M. B. and B. S. London in the same year, after which he acted as assistant house surgeon of Poplar Hospital. He joined the R. A. M. C. special reserve as Lieutenant on 6th August, 1914, two days after war was declared, and was promoted to Captain after a year's service. On 5th February, 1917, he took a permanent commission in the R. A. M. C. as Lieutenant, became Captain a year later, and for some time past had been acting as temporary Lieutenant-Colonel. He received the Military Cross on 23rd June, 1915.

Captain Dominick Thomas O'Flynn, R.A.M.C., died on service abroad of appendicitis on 16th June, 1918, aged 35. He was the fifth son of the late Edward O'Flynn, of Cork, was educated at Queen's College, Cork, where he was senior medical exhibitor, and qualified as L. R. C. S. I. and L. R. C. P. I. in 1906. He then went in for lunacy, and held the post of assistant medical officer successively in the Isle of Man Lunatic Asylum, and in the London County Asylums at Canehill and Hanwell. He took a temporary commission as Lieutenant in the R. A. M. C. towards the end of 1915, and was promoted to Captain after a year's service.

Captain Wilfrid Joseph Harrison Hepworth, R.A.M.C., died at Hyson Green, Nottingham, on 11th June, 1918. He was educated at Edinburgh University and at the London Hospital, took the L. S. A. in 1900, and the L. M. S. S. A. in 1914, and was in practice at Nottingham until he took a temporary commission in the R. A. M. C.

Lieutenant A. M. Clare, R.A.M.C., was reported as killed in action, in the casualty list published on 19th June, 1918. He was attached to the Durham Light Infantry.

Captain Philip B. Sewell, Australian Army Medical Corps, who was previously reported as missing, was killed in action on 25th April, 1918. He was educated at Melbourne University, where he graduated as M. B. in 1916, and immediately afterwards joined the Australian Imperial Force. He had served with a Field Ambulance and with an Australian Infantry Battalion at the Front.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, I. M. S., with effect from the dates specified:—

Justin Wilfrid Francis Albuquerque. 22nd June, 1918.

Anand Ramkrishna Bhat. 25th June, 1918.

Ram Lal Bhumbhwal. 3rd June, 1918.

Army Department Notification No. 282, dated the 7th April, 1911.

Army Department Notification No. 1790, dated the 19th October, 1917.

Army Department Notification No. 85, dated the 3rd February, 1911.

WITH reference to the notifications cited in the margin the promotion to present rank of Major Hamilton Maxwell Crundas, C.M.G., is antedated from the 28th January, 1911, to the 28th July, 1910, i.e., he has got accelerated promotion.

CIVIL ASSISTANT SURGEON JAI SINGH PRABHU DAS MODI, Rai Bahadur, lecturer, Medical Jurisprudence, Hygiene, Chemistry and Physics, Agra Medical School, to Lucknow, as officiating assistant to Civil Surgeon, Lucknow, and lecturer on Forensic Medicine, King George's Medical College, Lucknow.

Civil Assistant Surgeon Musharrat Ali, officiating assistant to Civil Surgeon, Lucknow, and lecturer on Forensic Medicine, King George's Medical College, Lucknow, to Agra as lecturer, Medical Jurisprudence and Hygiene, Agra Medical School.

THE head of the Medical Department of the Army of the United States is Surgeon-General Gorgas, of Panama fame.

LIEUTENANT-COLONEL W. D. HAYWARD, M.B., I.M.S., Medical Store-keeper to Government, Madras, is granted, under the terms of Articles 233 and 241, Civil Service Regulations, combined leave on medical certificate for six months, i.e., privilege leave for 26 days and leave on medical certificate for the remaining period, with effect from the 1st June, 1918.

Lieutenant-Colonel F. E. Swinton, I.M.S., Medical Store-keeper to Government, is posted to the Medical Store Depot, Madras, with effect from the 13th June, 1918, and until further orders.

ESTABLISHMENT of a military food laboratory for the Supply and Transport Corps.

It has been decided to establish a laboratory for food analysis for the Supply and Transport Corps as a temporary measure for the remaining period of the war and six months thereafter.

2. This laboratory which will be designated "The Military Food Laboratory" will be located as decided by His Excellency the Commander-in-Chief and will consist of a chemical section to examine the composition of foodstuffs and a bacteriological section for the purpose of investigating organisms that may be met with therein.

3. The cost of the scheme is estimated at Rs. 17,650 initial and Rs. 25,940 annual recurring. Of the above amounts the sum of Rs. 8,000 on account of the laboratory building is debitable to 47—M. W.—Ordinary Demands, and the balance, viz., Rs. 9,656 initial and Rs. 25,940 annual recurring to the Army estimates, and will be compiled under a new sub-grant "Military Food Laboratory for the Supply and Transport Corps" to be opened, with the usual minor heads in Part 1 of Grant 4 below the existing sub-grant "Supervision of Contracts and Stocks."

GRANT of medical and sub-medical charge allowances to civil sub-assistant surgeons, in civil employment, when placed in additional medical and sub-medical charge of Indian troops.

It has been decided that medical and sub-medical charge allowances shall be admissible to a civil sub-assistant surgeon in civil employment, when placed in medical or sub-medical charge of a regiment, etc., in addition to his civil duties, in accordance with clauses (1) and (2) and the first three sub-clauses of Army Regulations, India, Volume I, paragraph 957 (1915 edition), as it stood prior to its amendment by October Appendix, India Army Order 1917.

2. This decision has effect from the 18th April, 1917.

3. The regulations will be amended in due course.

ALLOWANCES for officers of the Royal Army Medical Corps employed as whole-time recruiting medical officers.

With reference to Army Instruction (India) No. 131 of 1918, it has been decided that when Royal Army Medical Corps Officers are appointed whole-time recruiting medical officers, they shall be entitled to an allowance of Rs. 150 per mensem, in addition to Royal Army Medical Corps pay of rank.

2. Temporary officers of the Royal Army Medical Corps serving under a contract will, however, receive either the pay of a regular Royal Army Medical Corps Officer of corresponding rank and service *plus* the allowance of Rs. 150 per mensem, or their contract rate of pay, whichever is greater.

THE following sensible letter has been issued by the Home Department, dated Simla, 22nd June, 1918:—

"With reference to the correspondence ending with the Home Department endorsement No. 1196, dated the 27th October, 1917, I am directed to say that the Government of India are pleased to sanction the reimbursement to officers of the second and third classes claiming travelling allowance under Article 1094 or 1098, Civil Service Regulations, of the cost of free transport by rail, steamer, or other craft, of a motor-cycle with or without a side-car, and to officers of the third class of that of an ordinary bicycle, in lieu of one horse, provided that such officers hold appointments in which the possession of a motor-cycle or bicycle is advantageous from the point of view of their efficiency.

2. Under Article 1094 (c), Civil Service Regulations and the Home Department letter No. 1195, dated the 27th October, 1917, to the address of the Government of Madras, a copy of which was communicated to other Local Governments with endorsement No. 1196 of the same date, an officer of the first class is entitled to the free transport of a motor-car in lieu of two horses and of a motor-cycle with or without a side-car in lieu of a motor-car. Under the orders contained in paragraph 1 above, a second or third class officer will now be entitled to the free transport of a motor-cycle in lieu of one horse. In conformity with this decision the Governor-General in Council is further pleased to sanction for a first class officer free transport of a motor-cycle, with or without side-car, in lieu of one of the horses to the carriage of which he is entitled.

3. The necessary amendments will be made in Articles 1094 and 1098 Civil Service Regulations, accordingly."

NARBHERAM PARBHUDAS BHANSALI is appointed a temporary Lieutenant, I. M. S., subject to His Majesty's approval, with effect from the 21st June, 1918.

SUBJECT to His Majesty's approval, the commissions of the undermentioned officers are antedated as shown against their names:—

Lieutenant B. C. Ashton, M.B., from 23rd January, 1917, to 17th July, 1915; Lieutenant R. Hay, M.B., from 23rd January, 1917, to 17th July, 1915; Lieutenant G. Shanks, M.D., from 23rd January, 1917, to 17th July, 1915; Lieutenant G. A. S. Ramsay, M.D., from 22nd January, 1917, to 17th July, 1915; Lieutenant R. M. Kharegat, M.B., from 23rd January, 1917, to 11th September, 1915; Lieutenant J. M. Shah, from 23rd January, 1917, to 17th December, 1915; Lieutenant W. M. Crombie, M.B., from 23rd January, 1917, to 22nd May, 1916.

LIEUTENANT-COLONEL H. S. WOOD, I.M.S., reverted in August from military duty and was posted to Assam. In exchange Lieutenant-Colonel Leventon, I.M.S., Superintendent of the Debrugarh (Berrywhite) Medical School comes to Calcutta as Superintendent of the Campbell Medical School, Sealdah, relieving Lieutenant-Colonel R. P. Wilson, F.R.C.S., I.M.S., Professor at the Medical College of the additional duty.

LIEUTENANT-COLONEL D. M. DAVIDSON, I.M.S., Lahore, was granted a month's leave from 10th August.

CAPTAIN P. TOOMEY, I.S.M.D. (retired), was appointed Civil Surgeon, Campbellpore, from 3rd July, 1918.

HIS EXCELLENCY THE GOVERNOR OF BOMBAY IN COUNCIL is pleased to make the following appointments pending further orders:—

Lieutenant-Colonel M. P. Khareghat, I.M.S. (retired), on the close of the Matheran season, to act as Presidency Surgeon, Second District, with attached duties, *vice* Major L. T. R. Hutobinson, M.B., B.C. (Caotah), D.P.H. (Cantab.), I.M.S.

Assistant Surgeon Dara Jamasp Asana, L.M. & S., on the close of the Mahabaleshwar season, to act as Civil Surgeon, Kaira, *vice* Assistant Surgeon Shankarlal Chunilal Jarivala, L.M. & S.

MAJOR W. E. McKEONNIE, I.M.S., whose services have been replaced temporarily at the disposal of this Government to Lucknow as civil surgeon and professor of midwifery, King George's Medical College, *vice* Lieutenant-Colonel G. T. Birdwood, I.M.S., granted leave.

LIEUTENANT-COLONEL R. G. TURNER, I.M.S., military medical officer, to hold civil medical charge of Roorkee, in addition to his own duties, *vice* Captain G. F. Dawson, R.A.M.C.

LIEUTENANT-COLONEL (temporary Colonel) H. BURDEN, C.I.E., I.M.S., is appointed from 1st April as A.D.M.S.:—

The London Gazette of 18th May (Gazette of India, 17th August), published the following mentions from the despatch of Sir A. B. Barrett for the Mahsud operation of March—



August, 1917. Colonel (now Major-General) P. Hohir, C.B., C.M.G., C.I.E., and the following officers, viz.:—

Lieutenant-Colonel (now Major-General) G. G. Giffard, C.S.I., I.M.S.; Lieutenant-Colonel C. H. S. Meyer, I.M.S.; Major C. C. Murison, I.M.S.; Lieutenant Colonel F. R. Ozzard, I.M.S.; Captain J. A. Sinton, V.C., I.M.S.; Lieutenant-Colonel J. B. Smith, I.M.S.; Major G. E. Stewart, I.M.S.

1st class Asst.-Surgeon H. A. Poyntz, I.S.M.D.; 1st class Asst. Surgeon W. H. Thipthorp, I.S.M.D.; No. 903 1st class Sub-Asst. Surgeon Mohammad Raza Khan, I.S.M.D.; 2nd Grade Ward Servant A. H. C. Jummon.

SUBJECT to His Majesty's approval, Dr. Sakria Nath Chaudhuri, late temporary Captain in the Indian Medical Service, is granted the honorary rank of Captain in the Indian Medical Service.

#### INDIAN MEDICAL SERVICE.

THE undermentioned Surgeon-Generals (ranking as Major-Generals) to be Major-Generals with effect from the date of their appointments as Surgeon-Generals:—

William Rice Edwards, C.B., C.M.G., M.D., K.H.P.; William Burney Bannerman, C.S.I., M.D., K.H.P.; Robert William Steele Lyons, M.D., K.H.P.; Courtenay Clarke Manifold, C.B., C.M.G., M.B.; William Henry Banner Robinson, C.B.; Patrick Hehir, C.B., C.M.G., C.I.E., M.D.

THE services of the undermentioned ladies have been brought to the notice of the Government of India for valuable services rendered in connection with the War up to the 4th August, 1917:—

Greatly daring the Government of India have published a list of ladies mentioned for good war work. Among them we find the names of the following ladies who are wives of medical officers in India:—

Mrs. Black, wife of Lieutenant-Colonel J. A. Black, I.M.S., Lahore.

Mrs. Buist, wife of Lieutenant-Colonel A. W. T. Buist, I.M.S., Rawalpindi.

Mrs. Drake-Brockman, wife of Lieutenant-Colonel H. E. Drake-Brockman, I.M.S.

Mrs. Elwes, wife of Major F. F. Elwes, C.I.E., I.M.S., Madras.

Mrs. Jackson, wife of Lieutenant-Colonel J. Jackson, I.M.S., Bombay.

Mrs. Jennings, wife of Lieutenant-Colonel W. S. Jennings, I.M.S., Poona.

Mrs. Lamont, wife of Lieutenant-Colonel J. C. Lamont, I.M.S. (retd.), Lahore.

Mrs. Liston, wife of Lieutenant-Colonel W. Glen Liston, C.I.E., I.M.S., Bombay.

Lady Lukis, wife of late Sir Pardey Lukis, K.C.S.I., Bombay.

Mrs. Lyons, wife of Major-General R. W. S. Lyons, I.M.S., Bombay.

Mrs. Melville, wife of Lieutenant-Colonel H. G. Melville, I.M.S., Lahore.

Mrs. Shaw, wife of Major W. S. J. Shaw, I.M.S., Poona.

Mrs. Stephenson, wife of Lieutenant-Colonel J. Stephenson, I.M.S., Lahore.

Mrs. Street, wife of Lieutenant-Colonel Ashton Street, I.M.S., Bombay.

Mrs. Walter, wife of Major A. E. Walter, I.M.S., Dehra-Dun.

It has been decided by the Secretary of State for India that no application for the transfer of subscriptions from the Indian Military Service Family Pension Regulations to the new Indian Military Widows' and Orphans' Fund will be entertained by him.

#### MEDICAL EXAMINATION OF RECRUITS FOR THE INDIAN ARMY.

It is notified that, for the duration of the war, the following medical officers and subordinates are authorised to examine recruits (both combatant and non-combatant) for the

- (a) (i) Indian Medical Service Officers.
- (ii) Royal Army Medical Corps Officers.
- (iii) Civil Surgeons.
- (b) (i) Assistant Surgeons appointed to act as Civil Surgeons.
- (ii) State Surgeons (not being officers of the Indian Medical Service).
- (iii) Specially selected Sub-Assistant Surgeons.
- (iv) Specially selected Sub-Assistant Surgeons.

2. The Medical Board required by paragraph 636, Army Regulations, India, Volume II, will be necessary in the case of recruits whose original medical examination was carried out by one of the medical officers referred to in paragraph 1 (a).

3. The services of medical officers of Native States can be utilised only when the previous sanction of the Darbar concerned has been applied for and obtained through the proper channel.

4. Assistant Surgeons, and Sub-Assistant Surgeons are authorised to examine recruits provided they have been specially selected and recommended by the Surgeons-General with Local Governments or by the Inspectors-General of Civil Hospitals. Whenever available, an Assistant Surgeon should be detailed to examine recruits in preference to a Sub-Assistant Surgeon.

It has been decided that, when an officer of the Indian Medical Service is in receipt of grade pay only and is appointed to the medical charge of a Labour, Coolie or Porter corps, or the depôt of such a corps, as his sole charge, he shall be allowed, in addition to grade pay, a medical charge allowance at the rates admissible for additional medical charge of followers, under Army Regulations, India, Volume I, paragraphs 117 and 11 (b). If, however, he is in receipt of consolidated pay attaching to the permanent medical charge of a regiment, either in virtue of his substantive appointment or under Army Department letter No. 5688, dated 21st April, 1917, he will continue to draw such consolidated pay without any additional remuneration.

2. It has also been decided that sub-assistant surgeons placed in sub-medical charge, of the above-mentioned corps or depôts, as a sole sub-charge, shall be granted an allowance as laid down for the sub-medical charge of Indian combatant units, *vide* Army Regulations, India, Volume I, paragraph 957, 1,000 men being taken as the equivalent of a regiment, and 500 as the equivalent of a wing.

3. In the case of officers, the decision has effect from the commencement of the war, and in the case of sub-assistant surgeons, from the 18th April, 1917.

IN view of the strength of the British garrisons in certain stations having increased abnormally on account of the war, sanction is accorded to the grant of the following increased rates of charge and subordinate medical charge allowances to Officers Commanding and Assistant Surgeons in subordinate medical charge of station hospitals at such stations:—

|   | Charge allowance per mensem for Officer Commanding.   | Sub-medical charge allowance per mensem for Assistant Surgeon. |
|---|---|--|
|   | Rs.   | Rs.  |
| Special Class I—Station hospitals in garrisons whose strength, including officers and families, is 7,000 and over.  | 1,600<br>(Consolidated salary, as for Officers Commanding, General Hospitals, under Army Regulations, India, Volume I, paragraph 13 (d).) | 90   |
| Special Class II—Station hospitals in garrisons whose strength, including officers and families, is 5,000 and over. | 300   | 75   |

## INDIAN MEDICAL SERVICE.

THE undermentioned to be acting Lieutenant-Colonels, under the provisions of Army Instruction (India) No. 62 of 1918, while commanding hospitals in the field for the periods noted :—

Major W. S. McGillivray, M.D., Officer Commanding, No. 1 African Stationary Hospital, Lindi. Dated 10th August, 1917, to 14th November, 1917.

Captain G. McG. Millar, M.B., Officer Commanding, No. 3 African Stationary Hospital, Dar-es-Salaam. Dated 28th March, 1918.

Captain G. F. Graham, M.D., Officer Commanding, No. 1 Combined Field Ambulance. Dated 16th April, 1917, to 3rd August, 1917.

Major C. G. Seymour, Officer Commanding, No. 3 African Stationary Hospital, Dar-es-Salaam. Dated 13th October, 1916, to 12th April, 1917.

Major H. W. Illius, Officer Commanding, No. 139 Indian Field Ambulance. Dated 19th September, 1914, to 25th April, 1917.

THE following is a continuation of Sir D. Haig's despatch of the 7th April, submitting names deserving of special mention :—

## INDIAN MEDICAL SERVICE.

Major D. H. F. Cowin, Major (T. Lt.-Col.) E. C. Hodgson, Lieutenant-Colonel J. B. Jameson, M.B., and Major E. A. C. Mathews, M.B.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified :—

Maneck Sohrabjee Hormusjee Mody, 18th June, 1918; Brij Ratan Jain, 8th July, 1918; Raghavendr Purushotham Bhat, 10th July, 1918; Chandrian Krishna Row, 12th July, 1918; Ganesh Dattatraya Apte, 12th July, 1918; Pandipedit Kutumbiah, 18th July, 1918; Krishna Kamal Das, 25th July, 1918; Prabodh Nath Bagchi, 25th July, 1918; Kailashnath Wagb-ray, 26th July, 1918; Dharendra Chandra Mazumdar, 26th July, 1918; Jagan Nath Goll, 28th July, 1918; Sahibzada Ahmed Khan, 30th July, 1918; Kanai Lal Bose, 30th July, 1918; Indra Bhusan Mazumdar, 2nd August, 1918.

THE following "mentions" are from the Salonica despatches: T. Lt. H. S. Rajan, M.B.; No. 2573 Sepoy Ward Orderly Sherif Hussain (Carnatic Infantry); No. 1441 Sepoy Ward Orderly Harnam Singh (Punjabis).

THE following "mentions" are made by General Allenby, Commanding the Egyptian Expeditionary Force, dated 3rd April, 1918. (*Gazette of India*, August, 24th.)

Brevet-Colonel W. Westropp White, C.B., I.M.S.

Major S. W. Jones.

Lieutenant-Colonel R. W. Knox, D.S.O., M.B., F.R.C.S.

Major M. F. White, M.B.

## INDIAN SUBORDINATE MEDICAL DEPARTMENT.

No. 1392, 3rd Class Sub-Assistant Surgeon Azam Ali Khan.

No. 293, 1st Class Sub-Assistant Surgeon Binden Panbarinath Godbale.

No. 1263, 2nd Class Sub-Assistant Surgeon Chhujju Singh.

No. 418, 3rd Class Sub-Assistant Surgeon Maniklal Motilal Talati.

No. 1383, 1st Class Sub-Assistant Surgeon P. P. V. Ramunni Nayar.

No. 363, 2nd Class Sub-Assistant Surgeon Raghunath Sitaram Patki.

No. 905, 1st Class Sub-Assistant Surgeon Shiua Parsbad.

No. 1178, 1st Class Sub-Assistant Surgeon Ziladar Khan.

## ARMY BEARER CORPS.

No. 18286, Daldhoj, Bearer; No. 5557, Israil Khan, L. Havildar; No. 5574, Khuda Bux, Naik; No. 5824, Kesang, Dhooly-Bearer; No. 550, Ramzan Ali, Bearer.

GENERAL SIR HERBERT PLUMER in a despatch, dated 18th April, 1918, makes the following "mention" for distinguished and gallant services :—

Lieutenant-Colonel J. C. Robertson, C.M.O., C.I.E., I.M.S.

FOR distinguished services in Egypt Major Clifford A. Gill, I.M.S., has been promoted to be Brevet-Lieutenant-Colonel.

To be Additional Members of the Second Class or Knights Commanders, of the Most Distinguished Order of St. Michael and St. George.

T. Colonel Sir Ronald Ross, K.C.B., F.R.S., F.R.C.S., A. Med. Serv. (R.P., I.M.S.)

SECOND CLASS ASSISTANT SURGEON J. A. GUIZEALAR, I.S.M.D., Civil Hospital, Quetta, is appointed to officiate as an Agency Surgeon of the Second Class, and is posted as Civil Surgeon, Sibi, with effect from the 10th June, 1918.

LIEUTENANT-COLONEL J. J. BOURKE, I.M.S., Assay Master, Calcutta, has been appointed to officiate as Mint Master, Calcutta.

LIEUTENANT-COLONEL G. G. GIFFARD, C.S.I., I.M.S., has been promoted Major-General on appointment as Surgeon-General to the Government of Madras, vice Major-General Bannerman, C.S.I. (retired). Major-General Bannerman went on leave pending retirement on 3rd January, 1918, and Colonel Giffard has been officiating as Surgeon-General. Major-General Giffard entered the I. M. S. on 31st March, 1890 and is still a young man, born 19th January, 1867. His very successful career in Madras as Superintendent of the fine, up-to-date Maternity Hospital is well known to our readers.

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Oriental Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage, abroad.

## BOOKS, REPORTS, &amp;c., RECEIVED :—

Labore Health Report.  
Delhi Health Report.  
Colombo Health Report.  
Patna Asylum Report.  
Gley and Fishberg's Internal Secretions (1918, W. Heinemann).  
Colonel Ford's Field Hygiene, 6s. (Heinemann).  
Medical Journal of the Siamese Red Cross.  
C. L. Greeno's Medical Diagnosis (Heinemann & Co.).

## LETTERS, COMMUNICATIONS, &amp;c., RECEIVED FROM :—

Colonel W. F. Cleveland, Simla; Lt.-Col. Spranson, Basra; Maj. F. P. Mackie, Baghdad; Capt. Finny, R.A.M.C.; Lt.-Col. Vaughan, Ranchi; Dr. Ida Scudder, Travancore; Major Hingston, I.M.S., Madras; Lt.-Col. F. P. Connor, I.M.S., Calcutta; Dr. K. K. Chatterjee; Colonel G. W. P. Dennings, C.I.E., Shillong.

## Original Articles.

### NOTES ON WAR SURGERY FROM THE INDIAN TROOPS WAR HOSPITAL, DEHRA DUN.

BY N. READER, R.A.M.C.,

CAPT. (T.C.),

*Surgical Specialist to the Hospital.*

THE Combined War Hospital for Indian Troops at Dehra Dun is magnificently situated on rising ground at the foot of the Himalayas. Nestling above it, on the hill-side, is the hill station of Mussoorie, so close that on a clear day each individual house may be plainly seen. On the highest point of the rising ground, overlooking a wide nullah, are the Tubercle huts. A better site for a hospital in Dehra Dun could not possibly be chosen.



The general plan of the hospital is very simple, as the builders have not been hampered by any lack of space. The bulk of the patients are housed in blocks. These are substantial one-storied buildings, made of stone. Four blocks hold fifty beds each, the fifth twenty-eight beds.

The accommodation of the blocks is supplemented by huts. These are cheap but very efficient buildings. The walls are of wood, lined inside with white-washed canvas. The ceiling is also of the same material. The roof is thickly thatched, and carried down on each side to form a verandah. Each hut contains 10 beds. Four doors and four windows give good ventilation. Further up the hill are the Tubercle huts, three in number. These are on the Bhowali principle,—large verandah-like structures, raised from the ground, entirely open in front and ventilated behind by large windows. The fronts are provided with chinks. Each bed is opposite a window.

To the right of the road, on the fringe of the jungle, is the Isolation Camp. The camp is

self-supporting, having its own cook-houses, washing and bathing arrangements and sterilizing apparatus. It is separated from the rest of the hospital buildings by a deep nullah.

Half a mile nearer the hills lies the Convalescent Camp, consisting of thatched wooden huts, capable of accommodating, in all, two thousand men. Other buildings are numerous. A large Administrative block includes the dispensary, a small store-room, and the offices of the Senior Medical Officer and of the Medical Officers of the 2nd and 9th Gurkha Regiments. In addition, there are store-houses, dining-tents, tents for clothing and quarters for the subordinate staff, etc.

The total capacity of the hospital is 508. Two of the blocks are for regimental cases. The Operating Theatre adjoins the Administrative block. It has been recently brought up to date by the addition of Anæsthetic and Sterilising rooms and a high pressure Steam Sterilizer. The Brigade Pathological Laboratory also adjoins



the Administrative block. Throughout, the hospital is supplied with electric light, and in one of the wards ceiling-fans have been fitted.

*Class of patient.*—The hospital is intended entirely for Gurkha patients, but occasionally a Mohammedan is admitted for special treatment. During the last two years, most of the cases have come from Mesopotamia, but France, Gallipoli, Waziristan and Palestine have all contributed a share. The Gallipoli cases were mostly trench feet, received during the cold spell in November, 1915. These have proved most intractable to treatment, and generally ended in amputation—when the patient was willing to submit to it. From my experience, I should say that amputation was indicated early in these cases, thereby saving the patient much suffering and disappointment and obtaining early, by means of an artificial appliance, a better functional result than years of conservative treatment is able to give.

*General nature of wounds.*—The Dehra Dun Indian War Hospital is the last medical unit in

the line of evacuation for Gurkhas. As a result of this, the cases that arrive for treatment are generally of a very chronic nature, and not such as respond easily to treatment. The highly infected, grossly suppurating, wounds that fill the wards of the more advanced base hospitals are relatively few. In their place are found chronic sinuses, mal-united fracture, ankylosed joints, deep-seated foreign bodies, old nerve injuries, and the like. A large number of patients require sooner or later to be invalided out of the Army. In those who become eventually fit, healing is slow and tedious.

**Technique of operations.**—Few words are necessary under this heading, the ordinary procedures being adopted. The patient's skin is prepared with iodine. Preparation in the ward is reduced to a minimum. To the native mind the size of the operation is in proportion to the area of skin prepared, and many have steadfastly refused operation as a result of elaborate technique in the ward. The hands are scrubbed in biniodide and water and afterwards in spirit. When dry, the hands and forearms are painted with iodine. The colour easily comes off, especially in the presence of blood serum. For sutures and ligatures, silkworm gut is used almost exclusively. Each strand should be uniformly translucent, of equal thickness throughout, and the surface should be smooth and polished, without a flaw. These sutures are, of all, the most convenient and reliable. They may be boiled repeatedly without deterioration. The thin varieties may be used for sewing the peritoneum and other delicate structures, and for the ligature of blood vessels, the thicker for the suture of muscles, tendons, fascia, etc. Thus they may be used throughout for the sewing up of the abdomen or for the radical cure of hernia. Silk, I think, is better avoided except for hæmorrhoids, where it readily comes away. Catgut is seldom reliable. It is better boiled in ether and alcohol in a Mayo Robson's drum. When the lithotomy position is required, the length of the operating table is temporarily lengthened by the addition of a glass-topped table of the same height, and the patient arranged, before the commencement of the anæsthetic, with his buttocks in the right position. This saves moving the patient later, a procedure that may induce vomiting or bring him round from the anæsthetic. When ready, the additional table is removed and the legs supported in the usual way.

**Methods of wound treatment.**—The great advances since the commencement of the War necessitates a brief résumé of the main method of wound treatment, with special reference to their application to cases at Dehra Dun.

**Physiological methods.**—Since the institution of the later methods the use of hypertonic saline solutions has been practically abandoned, but in

the early days of 1917, in one ward at least, this method of treatment was a routine procedure. After a preliminary surgical cleansing of the wound, a 5 per cent. salt solution was used with the addition of sodium citrate. In wounds that did well, a raw-beefy appearance was evident after a few days. This was regarded as an indication for the application of normal saline. In more intractable cases a salt pack was used. As none of the wounds were grossly suppurating and many would doubtless have healed under any form of treatment, an adequate criticism cannot be made.

**Hypochlorous acids.**—In spite of adverse criticisms chlorine still remains one of the surgeon's most faithful allies. In many cases, after trying in turn a variety of treatments, one has returned to our old friend ensol and not found him wanting. Ensol is particularly useful after a preliminary treatment with flavine, when it quickly dissolves away the yellow fibrinous membrane and procures a clean, granulating surface. A good way of preparing ensol is that of Loraine Smith (*B. M. J.*, Sept. 22, 1917).

- |   |              |
|---|--------------|
| (1) Liq. Calcis Chlorinate (i.e. 10% Solution of Bleaching Powder)            | ... 135 c.c. |
| Water   | ... 750 c.c. |
| (2) Conc. Boric Solution (4%) [Keep in separate bottles and mix as required.] | ... 250 c.c. |

Of other preparations of hypochlorous acid, Dakin's solution calls for comment, and this brings us to the consideration of the *Carrel-Dakin Treatment*.

An excellent account of the Carrel treatment, with details for making Dakin's solution, will be found in the *British Journal of Surgery* for July, 1917. The quantities of chloride of lime, exsiccated carbonate of soda and bicarbonate of soda are given for bleaching powders whose chlorine content varies from 20 to 37%. Of the samples of bleaching powder I have tested in India, I have found none contain as much chlorine as 20%, the average being about 17%. The following quantities give a Dakin's solution of approximately correct strength for a 17% concentration.

| Standard of Chloride of Lime. | Quantities required to prepare 10 litres of Dakin's solution containing .45 to .5% Na Cl O. |                                 |                      |
|-------------------------------|---|---------------------------------|----------------------|
|                               | Chloride of Lime.   | Crystallized Carbonate of Soda. | Bicarbonate of Soda. |
| 17                            | Grms. 250.  | Grms. 345                       | Grms. 105            |

After preparation, the strength should be checked in the usual way, with a decinormal hypsulphite solution, in the presence of potassium iodide and acetic acid. An effective method of storing Dakin's solution is in a thermos flask. A solution tested two months after preparation showed no deterioration in concentration. A convenient apparatus for producing intermittent irrigation is shown in the accompanying sketch, which more or less explains itself. The lower

# NOTES ON WAR SURGERY FROM THE INDIAN TROOPS WAR HOSPITAL, DEHRA DUN.

By N. READER, R.A.M.C., CAPT. (T.C.),

*Surgical Specialist to the Hospital.*

## "3-Needle" method for Haemorrhoids

## Method of automatic Irrigation for Carrel's treatment

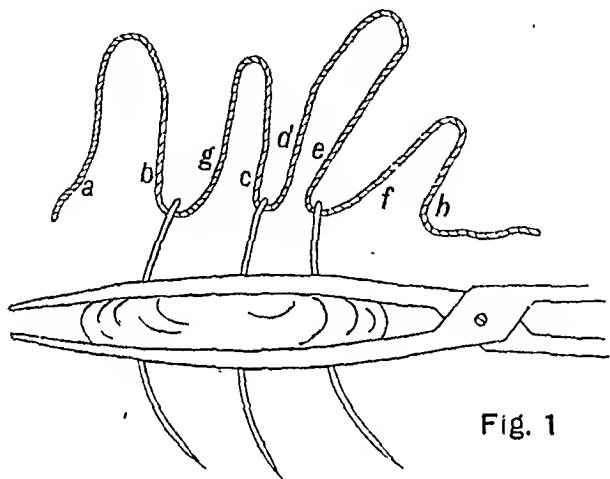


Fig. 1

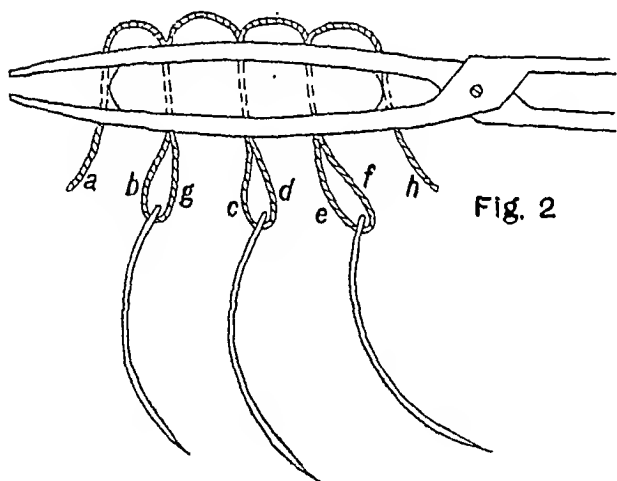
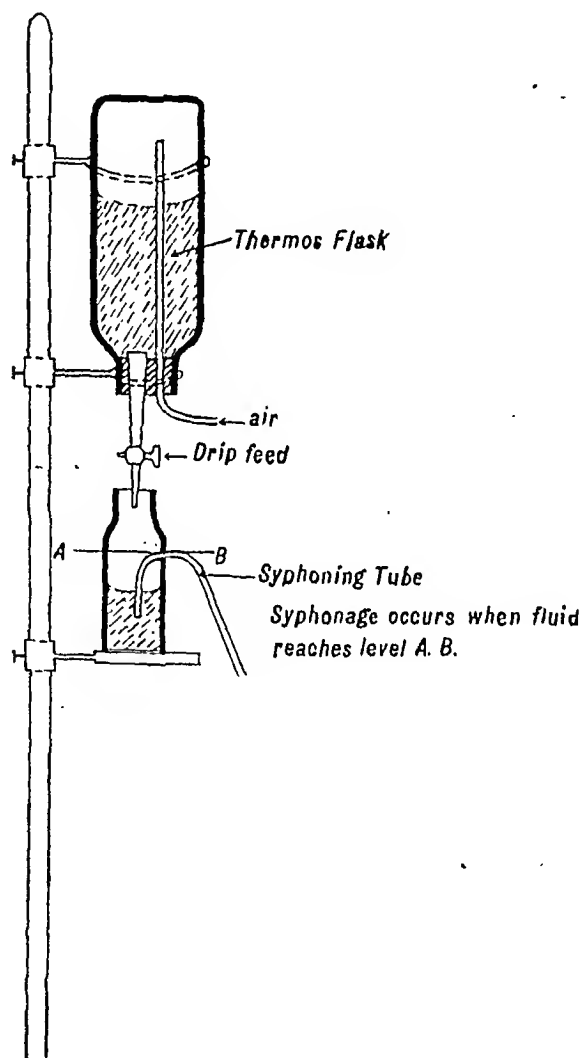


Fig. 2

Fig. 3







bottle may be made out of an ordinary bottle of 20 or 30 c.c. capacity by heating in a blowflame the side of the bottle above the centre and pulling the molten glass out with forceps. When the protruding glass is broken off, a hole is left, and this may be enlarged to the required size by again heating and working round a metal rod. A piece of rubber tubing which fits the hole tightly forms a sufficiently watertight joint. The drop feed may be arranged to give a syphonage every two hours or oftener as required.

When pus is present in a wound there is no danger of injuring the skin with Dakin's solution, but should protection be required this may be provided by applying to the skin a coarsely-meshed fabric previously soaked in melted vaseline and cut to fit the part exactly.

According to Morgan Saner and Schlesinger (*B. J. S.*, Jan., 1918), the action of Dakin's solution consists in its proteolytic property, whereby necrotic tissue is dissolved out of the wound and the pabulum for germicidal growth removed. In this way they explain the rapid sterilization of wounds, and they recommend hourly irrigation where dead tissue is plentiful.

✓ *Flavine*.—Thanks to the kindness of Professor Browning, of the Bland Sutton Institute, the Dehra Dun War Hospital has been supplied with proflavine, acriflavine and brilliant green from their earliest days, and we have thus had the opportunity of giving them an extended trial. It is beyond the scope of these notes to discuss the heated controversial questions that have arisen in connection with flavine. In our own experience, flavine has proved of high clinical value, and we consider it occupies a high place in the armamentarium of the surgeon. Its greatest field of usefulness is in severely septic wounds. We have found that the temperature becomes quickly reduced, signs of inflammation round the wound rapidly subside, and the patient feels much improved in general well-being. After a few days a thick, yellow, fibrinous membrane begins to form, and the continuation of flavine after this point probably does more harm than good. The membrane is readily dissolved away by eusol, leaving underneath a healthy, granulating surface. The simplicity of technique in the application of flavine is a high point in its favour. For chronic wounds we are of opinion that flavine is of no value.

Out of many cases treated with flavine, I quote one in which the results were remarkable.

*Case 221*.—No. 291, R./M., Rajbir Pun, 1/8 G. R., was admitted with an enormous axillary abscess extending down the arm and across the chest.

The skin was red and angry over a corresponding area. An incision, 9 inches long, was made and a large quantity of foul pus evacuated, along with many broken-down, caseating tuberculous glands. It was intended later, after the

inflammation had subsided, to perform a radical operation on the axilla. In the meantime, the wound was freely swabbed with flavine, 1/1000, and packed with gauze soaked in this solution. Daily dressings were carried out with flavine, and within a few days of operation the cavity was greatly reduced in size and discharge was practically nil. Ten days after operation the wound was superficial only. There was some retraction of the skin as healing continued, and the scar tissue began to interfere with movements of the shoulder. Later, a small plastic operation was done; union occurred by first intention. Patient was discharged from hospital cured with a perfect range of movement."

✓ *B. I. P. P.*—The bismuth paste used at the hospital is prepared according to Rutherford Morison's original formula :

|                 |     |            |
|-----------------|-----|------------|
| Iodoform        | ... | 16 parts.  |
| Bism. Sulph.    | ... | 8          |
| Liquid Paraffin | ... | 8 or Q. S. |

The iodoform and bismuth should be thoroughly mixed in a mortar and the paraffin added gradually. When the paste has assumed the required consistency, it should be taken bit by bit and rubbed down on a slab with a spatula. It is most essential that no grittiness should be present and the whole paste should be perfectly homogeneous. Failure to prepare the paste properly will cause disappointment in results. Those not familiar with the exact technique of bismuth paste cannot do better than consult Rutherford Morison's own article in the *British Journal of Surgery* for April, 1917. Exact attention to detail is the key of success.

At Dehra Dun we have found bismuth paste by far the most useful method of treatment for the majority of wound cases, both in the operation theatre and in the ward. For injecting the paste into sinuses a urethral syringe serves the purpose admirably. The plunger is withdrawn and the syringe partially filled with the paste at the wide end. On returning the plunger the paste may be expressed as a fine ribbon from the nozzle. The nozzle of the syringe is boiled after each injection. It is not wise to boil the whole syringe as the paste goes black. The black paste in the nozzle should be expressed before the next injection. Of the numerous cases treated with bismuth, I quote three at present, others will be mentioned later.

"*Case 328*.—No. 3391, R./M., Narain Mal, 2/9 G. R., was shot in the thigh by a shot gun, at close range, causing a severely infected, penetrating wound. At operation the anterior wound was widely opened up and the track of missile explored. The muscles were charred and extensively lacerated. The bone was stripped but not injured. All obvious damaged tissue was cut away and the bleeding arrested. The edges of the skin were widely resected. The posterior

wound was treated in the same way. Strips of gauze soaked in spirit were vigorously drawn through the wound, followed by a thorough application of bismuth paste to all exposed surfaces. The anterior wound was completely sewn up in spite of considerable tension. The posterior wound was partially sewn, a tube being inserted for 24 hours. Dressings were carried out every 5 or 6 days. Ten days after operation the anterior wound was practically healed, and the stitches were removed. The posterior wound was healthy and granulating. From this point onwards recovery was uninterrupted."

"*Case.*—The following operation was done by way of demonstration of the bismuth technique at the Cantonment Hospital, Delhi. The man chosen for operation was one suffering from septic amputation stump at the site of election. The stitches had sloughed away and the edges of the flaps were widely separated. The base of the wound was covered with an unhealthy slough and suppuration was profuse. Every one knows how intractable these cases are. In the ordinary way six months or more would have elapsed before healing was complete.

*Operation.*—The wound was widely opened and all sloughy tissue cut away with scissors. The edges of the flaps were resected. After control of the bleeding, spirit was rubbed in, followed by bismuth paste. The muscles were sewn over the bone with catgut, and the skin edges brought together. The wound healed by first intention and an excellent stump resulted. The results were the same as if the wound had healed by first intention on the first occasion."

"*Case.*—No. 2937, Kirtima Limbu, 2/2 G. R., was admitted on 7-5-17 suffering from a G. S. W. of the head. The bone was deficient over an area 2 inches by 1 inch. The wound was chronically septic and multiple sinuses led inwards in different directions. Many forms of treatment were tried, but discharge still continued and condition of the wound did not improve. On 16-7-17 B. I. P. P. was injected into the sinuses and this treatment repeated every four or five days. The discharge rapidly became less. On 13-8-17 (*i.e.*, in less than a month) the wound was healed. On 1-9-17 the wound broke down again, slightly but was quickly controlled by the bismuth treatment and no further trouble has ensued, the wound remaining soundly healed."

Of course, it cannot be expected that all wounds will respond as readily to B. I. P. P. treatment as in the cases recorded above, but the cases illustrate what results the method is capable of producing. It strikes me as one of the most startling discoveries of the War, that one should be able to sew up a highly infected wound and obtain primary union.

Bismuth paste has a wide field of utility in controlling sepsis in bone and producing osteo-

genesis. It is thus of special value in the treatment of compound fractures. The long interval between dressings especially recommends it for use in these cases. Captain Laborda, R. A. M. C., (T. C.), Ear Specialist to the 7th and 8th Divisions, tells me that he has found B. I. P. P. of great use in the treatment of middle ear diseases.

#### NOTES ON GROUPS OF CASES.

*Chronic Sinuses.*—As already mentioned these form the bulk of the cases requiring surgical treatment.

A simple sinus—*i.e.*, one not associated with the presence of a foreign body or diseased bone—will often heal with injections of bismuth paste.

"*Case.*—No. 4099, R./M., Hastabir Rana, 1/5 G. R., was admitted on 7-2-18 with a sinus 4 inches long in the neck, following removal of a foreign body. B. I. P. P. was injected every 3 or 4 days and the sinus was completely healed on 23-2-18 (*i.e.*, within 15 days of admission)."

When the wall of the sinus is hard and lined with epidermal tissue or when the sinus is long and tortuous, excision is recommended.

"*Case 44.*—No. 134, R./M., Jasbir Thapa, 1/2 G. R., was admitted with a sinus 7 inches long in the thigh. At operation the whole track of the sinus was exposed and the walls completely removed. No foreign body was present and no injury to bone. The large wound in the thigh was sewn and union occurred by first intention."

I am strongly opposed to the scraping of sinuses. One comes across cases in which sinuses have been scraped ten or fifteen times. At best, the procedure is a shot in the dark, and, if successful, is a matter of luck. In a sinus which refuses to heal, there is always a definite cause underlying the condition. This cause should be looked for by open operation and dealt with efficiently. Thus, in a tuberculous sinus a suppurating gland is generally present beneath the deep fascia. No amount of scraping will deal with this efficiently. Other sinuses may be associated with chronic osteomyelitis and a cloaca is present in the bone. Again, the bone may be extensively diseased or tunnelled and fissured as a result of a G. S. W. In none of these cases is scraping of the slightest value. The patient is asked to submit to a perfectly inefficient operation.

My own procedure in these cases is as follows:—

The patient is X-rayed with a view to determining the presence of a foreign body and the condition of the bone. At the operation, the track of the sinus is first enlarged sufficiently to insert the finger, and any obvious loose pieces of bone removed through this opening. This admits of further exploration by the finger and an idea is formed as to where to make an incision to the best advantage. The line having been chosen, the bone is boldly cut down upon and the tissues separated from it with a periosteal elevator. When a good view of the bone has been obtained, the exact condition found may be dealt with. In many G. S. wounds the bone is extensively tunnelled or fissured as a result of callus bridging over gaps in the process of union. These holes in the bone form pockets for the collection of pus and healing is impossible as long as they exist. The object of operation is to convert these holes into shallow grooves, so that the soft tissues may fall in and obliterate the space. Each case must be judged on its merits and the bone freely cut away with a hammer and chisel. The track of the sinus in the soft parts is eradicated and the skin edges pared. The wound is "hipped," and either left open or sewn up as seems advisable at the time. I quote a few cases by way of illustration.

"*Case 138.*—No. 516, R./M., Nand Ram Thapa.

*Operation,* 22-5-17. Sinus of right arm involving humerus. A long hole was found perforating the bone. This was enlarged with a chisel and the walls cut away so that a wide shallow groove was left. The wound

was healed on 12-7-17, i.e., within two months of operation."

"Case 302.—No. 3074, R./M., Kharagbir Thapa.

Operation, 10-12-17, for chronic sinus of back. Incision made down to bone and tissues separated with periosteal elevator. Bone cut away with chisel and forceps until underlying cavity was freely exposed and a bed made for the soft tissues. Bipped, not sewn. Healing was complete on 31-1-18, fifty days after operation."

"Case 193.—No. 193, I/N., Inderbir Khattri.

Operation, 14-8-17, for chronic sinuses of leg involving the tibia. Wounds opened and edges freed from bone. Many pieces of dead bone removed. Cavity on outer side of bone obliterated by removing walls with hammer and chisel. Bipped, not sewn. Patient discharged, healed, on 18-12-17."

"Case 189.—No. 4873, R./M., Gampha Thapa.

Operation, 11-8-17, for sinuses of the arm with disease of bone. Inner sinus opened and several large pieces of dead bone removed. Humerus tunnelled. Outer sinus opened and bone exposed thoroughly. Floor of tunnel removed and tunnel connected into a groove. Wound "bipped," and both openings sewn up. Healed on 2-11-17 (i.e., under three months).

Other cases treated in this way were Nos. 152, 162, 179, 287, 240. The average duration of healing was 3 to 4 months. It will thus be seen that an enormous saving of time was effected in the healing of these cases, many of which had already received treatment on more conservative lines for a year or more. It may be noted further that only one operation was necessary in each case. Everything is in favour of the most radical procedure.

*Foreign bodies.*—The X-ray work is done by the Lady Chelmsford Special Red Cross War Hospital. Localisation is carried out by taking two photographs on the same plate after moving the focus of light through a measured distance. From this the depth of the missile is determined, below a given mark. When the bullet is deeply situated and a photograph in one plane only can be taken, this method is not very satisfactory from the surgeon's point of view, as a slight error in direction superficially is greatly magnified at a depth of 3 or 4 inches.

The removal of a foreign body is always a matter of interest, and curious conditions are occasionally met with.

"Case 18.—On 23-2-17, R./M., Lalchand Thakur complained of a swelling of the tongue. This was due to an abscess. On opening the abscess, the complete crown of a molar tooth was found in the cavity. This was blown into the tongue at the original gun shot injury to the face and jaw, and remained quiescent for many months. At the time of operation the wound of the face was completely healed."

"Case 13.—No. 3131, R./M., Bahadur Thapa presented the opening of a minute sinus 2 inches behind the ear. On exploration a narrow track was found in the bone. On opening the track with a gauge, a complete unmarked shrapnel bullet was found in the mastoid antrum. The bone had grown over completely, save for the minute track mentioned."

"Case 288 illustrates three points:

- (1) An operative difficulty.
- (2) The power of bone repair.
- (3) The unreliability of symptoms in a native patient.

No. 1058, R./M., Birbal Thapa, 1/4 G. R., complained of severe pain in the hip on walking. An X-ray photograph showed a shrapnel bullet in the region of the great trochanter. Accurate localisation was carried out and measurements given from two lines A and C D marked on the patient's skin in front. No difficulty was anticipated in finding the bullet. At the operation a prolonged search was made in front of the trochanter, over the neck of the femur, upwards under the attachments of the pyramiformis and gemelli and

downwards under the vastus externus. No signs of a foreign body could be found. The back of the great trochanter was next explored, similarly without result, yet the foreign body was large and plainly to be seen in the plate. Eventually, on the grounds that only one place had not been explored, the bone was cut open with a chisel. There, neatly embedded in the trochanter and surrounded by a well-formed capsule of dense bone, was a complete shrapnel bullet. The regeneration of the bone was perfect. It was impossible that a bullet so completely encapsuled could have caused the patient the slightest pain. The wound healed by first intention and patient was discharged fit."

*Bone Injuries.*—A large number of cases are received for treatment suffering from mal-united fractures and gross bone deformities. In some of these cases bone plating has been undertaken, but the results on the whole have not been satisfactory. In cases that have suppurated profusely, latent sepsis is present for many months, and fresh trauma to the bone, with the added irritation of a foreign body, readily lights up the old infection. It is not safe to operate on these cases for at least six months after the wound has become firmly healed. Thorough preparation of the skin must be commenced several days before the operation, and at the operation itself the most scrupulous asepsis must be maintained. The incision must be long enough to allow the manipulation of the bone to be carried out with the least disturbance to the surrounding parts. A brief epitome of seven cases is given:—

"Case 72.—No. 2590, R./M., Padam Sing Mohat. Operation, 5-4-17. Old fracture of jaw with non-union. Ends of bone freshened and plate applied with four screws. Plate removed, 16-5-17. Good union occurred and patient was discharged fit.

"Case 74.—No. 1780, R./M., Budh Sing Gurung. Operation, 6-4-17. Mal-united fracture of femur with gross deformity of leg. Fracture broken down. Irregular bone removed and ends sewn off square. Plate applied with 10 screws. Wound suppurated. Plate removed on 23-4-17 and bones wired. Union of bone eventually occurred in good position, but chronic sinus is present in leg. Patient refuses further operation.

"Case 110. No. 1616, R./M., Hari Lal Rana. Operation, 3-5-17. Old mal-united fracture of radius. Overlapping fragments separated and ends adjusted. Plate with 4 screws. Wound healed by first intention. Stitches removed, 10-5-17. Later sinus developed. Wound explored on 20-8-17. No focus of infection found. Plate was firmly attached to bone but was removed. Sinus persisted. Was reopened on 19-10-17. Wound healed on 20-3-18.

"Case 112.—No. 1674, Hari Sing Chattri. Operation, 4-5-17. Mal-united fracture of femur with presence of foreign body, 3 inches shortening. Old fracture broken down and ends adapted. Wired. Foreign body removed. After operation 1/4 inch shortening only. Patient died next day from pulmonary embolism.

"Case 141.—No. 1649, Hangjit Rai. Operation, 24-5-17. Marked contraction of all tendons in front of forearm. 1" of bone resected from radius and ulna. Wired. Later, wire was removed. Wounds healed, 10-9-17, and bones united. Patient made excellent functional recovery and on discharge had full use of the hand.

"Case 255.—No. 1857, Porter Budramani Upadhyay. Operation, 30-10-17. Fractured humerus with non-union and mal-position. Ends sewn off square. Plate applied with 6 screws. Plate removed on 25-1-18. Wound healed on 19-4-18 with fracture firmly united in good position.

"Case 336.—No. 4119, Ram Sing Gurung. Operation, 8-2-18. Chronic non-union of radius. Ends slightly pared and plate with 4 screws applied. Wound healed by first intention. X-ray showed bones in excellent position. Made uninterrupted recovery with good functional result.

It will thus be seen that in the last case only was it unnecessary to remove the plate or wire. In case 110,

the plate was firmly united, but was removed on account of a chronic sinus, the actual cause of which was not discovered.

*Nerve Injuries.*—Below will be found tabulated a record of eight cases of nerve injury operated upon in the course of a year. Another case is included in which operation was performed previous to admission. The electrical reactions were tested by a condensor discharge at 100 volts. A normal reaction of a muscle occurs at .02 to .06 micro-farads. Anything above .1 may be taken as indicating a degree of degeneration. The term R. D. is used only in a conventional sense and does not bear its old significance in relation to A. C. C., K. C. C., etc.

A new bed for the nerve was made wherever possible by obliterating the old track and laying the nerve between layers of undamaged tissue. Cargile membrane or other protective coverings were not employed on the grounds that these probably increase adhesions later on. All cases are sent after operation for electrical treatment and massage. It is needless to point out the utmost importance of a relaxation apparatus for continuous use in all cases of foot drop and wrist drop. An over-stretched muscle has small chance of recovery, though this occurred in case 330 where tenotomy was required to overcome the chronically contracted calf muscles. Once a pattern of a relaxation apparatus is obtained, duplicates may be

TABLE OF NERVE INJURIES.

| Case. | Nerve.          | Clinical Findings.  | Date of Operation.      | Operation Findings and Procedure.  | Wound Result.  | Functional Result.   |
|-------|-----------------|---|-------------------------|--|----------------|--|
| 129   | Sciatic ...     | R. D. External. Popliteal group of muscles.   | 15-5-17.                | Lateral wound sciatic N. scar tissue removed. Incisions in sheath.   | Primary union. | Discharged improved on 24-11-17.   |
| 164   | Musculo-spiral. | Complete R. D. of muscles supplied by M. S. nerve.  | 28-6-17.                | Adherent to periosteum over fractured humerus. Infiltrated with fibrous tissue. Dissection of nerve. New bed.  | Primary union. | Reactions normal on 6-10-17. Complete functional recovery by 4-12-17.                    |
| 166   | Musculo-spiral. | Partial R. D. six weeks' electrical treatment previous to operation.                          | 6-7-17.                 | Ends of nerve completely separated. End to end suture.   | Primary union. | 6-10-17. Discharged for misconduct. No improvement up to date.                           |
| 188   | Median ..       | Complete Anesthesia median supply. Wasting thenar eminence.                                   | 11-8-17.                | Bullous enlargement. Complete fibrous obstruction. Resection 1½". End-to-end suture.                           | Primary union. | Discharged, 21-9-17. Late result no. known.  |
| 369   | Ulnar ...       | Partial loss of epicritic and protopathic sensibility, lumbricals. 1 & 2 .125 3 & 4 .33       | 22-3-18.                | Fibroma of nerve upper arm. Dissection. New bed.   | Primary union. | 18-5-18. Regeneration taking place. Sensation returning lumbricals. 1 & 2 .025 3 & 4 .05 |
| 233   | Ulnar ...       | Loss of sensation, ulnar distribution. wasting small muscles of hand.                         | 23-9-17.                | Complete fibrous block. Resection 1½". End-to-end suture.  | Primary union. | 26-3-18. Discharged with improved sensation, but incomplete recovery of muscles.         |
| 374   | Median ...      | "Reactions point to complete division of median nerve low down" (abst. of Electrical Report). | 27-3-18.                | Complete fibrous block. Resection 1". End-to-end suture.   | Primary union. | 6-6-18. No sign of recovery. Trophic changes in skin. Marked wasting of muscles.         |
| 392   | Musculo-spiral. | Extensor group of forearm. Left .5 Right .025   | 22-4-18                 | Adherent to periosteum. Over fracture of humerus. Dissection. New bed.   | Primary union. | Under electrical treatment. No change up to date.  |
| 330   | Sciatic ...     | Drop foot. Tibialis Anticus .125  | (1) Unknown (2) 1-2-18. | No details available (2) Tenotomy of tendo achillis for contracture. Plaster, six weeks' relaxation apparatus. | Primary union. | Muscles recovering. Tibialis anticus .06.  |

It will be seen that out of nine cases operated upon the incidence was—

|                |     |   |
|----------------|-----|---|
| Musculo-spiral | ... | 3 |
| Median         | ... | 2 |
| Ulnar          | ... | 2 |
| Sciatic        | ... | 2 |

In only one case (No. 166) were the nerve ends completely separated. In this instance the upper end was frayed out in the form of a fibrous fan and incorporated with the external intermuscular septum. The lower end about an inch below was bound down by a fibrous adhesion.

In four cases end-to-end anastomosis was necessary. In other four fibrous tissue was removed without interfering with the continuity of the nerve.

End-to-end suture was performed with catgut. In all cases the nerve ends were brought together without difficulty, where necessary by making a short cut and flexing the joint.

made by a local *mochi*. Discarded inner tubes of ambulance motor tyres make excellent elastic bands. As regards end results (column 7), these were not able to be obtained in every case. The exigencies of hospital accommodation required that some should be discharged while still undergoing post-operative treatment. I have been unable to trace the further progress of these cases. In other cases, the interval has been too short since operation to obtain any definite result.

*Oriental Sores.*—In these notes I am indebted to my colleague Lieut. W. H. Eggar, R.A.M.C. (T.C.), who has treated a large number of cases. In his experience potassium permanganate has, on the whole, proved the most useful method of treatment and is especially recommended for those cases in which the sore is covered with a hard, brawny, indurated scab. The salt is applied in finely powdered form and left on for two or three days. At subsequent dressings new powder is applied on top of the old, though it is



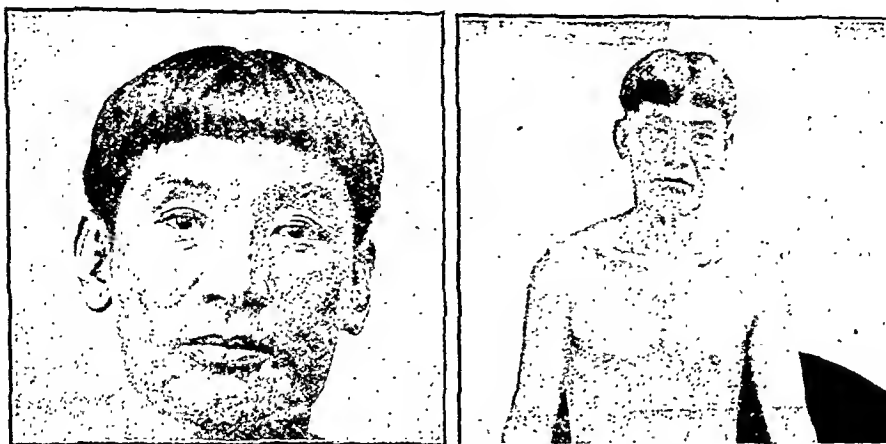


CASES OF LEPROSY IN THE BANGKOK MAIN PRISON  
TREATED WITH SODIUM GYNOCARDATE  
AND SODIUM GYNOCARDATE "A."

By DR. M. CARTHEW, M.D.,

*Medical Officer, Local Sanitary Department, Bangkok, Siam.*

CASE I.



CASE IV.



CASE VII.



recommended by some that the wound should be thoroughly cleaned on each occasion. When a raw surface has been produced, treatment is carried on by means of fomentations or cusol dressings. It has not been the experience of this hospital that potassium permanganate causes great pain.

Scraping is recommended in those cases in which the scab is more or less detachable and in which there are no outlying papules round the main sore.

In sloughy conditions, fomentations are applied until the wound is clean, a bland ointment being then substituted. In a number of cases which have resisted treatment by other methods a 1 per cent. tartar emetic ointment has proved of value, but all cases do not do well under this menage. The same equally applies to sulphur ointment. Some cases have proved intractable to all the above forms of treatment, but have responded quickly to intravenous injections of Tartar Emetic, 10 c.c. of a 1 per cent. solution being introduced into a vein of the arm. Intravenous injections of tartar emetic are by no means a certain cure. Some types of sores do not respond in the least. When other methods fail, ionisation with zinc sulphate may be tried. Sores healed by ionisation seem to break out again very readily. Possibly the treatment causes only a temporary quiescence of the Leishman-Donovan body. The application of sheet-lead has not been tried in this hospital, but good reports were received of it from Waziristan. Whether these were true oriental sores or not, has not been determined.

**Hæmorrhoids.**—I take this opportunity of publishing, for the first time, an operation for hæmorrhoids I have been in the habit of performing for several years. I refer to it as the "Three-needle" method.

The pile is grasped in the long axis of the bowel by a long narrow clamp, preferably of the Robert Jones' pattern, which does not slip. A piece of silk, about 3 foot long, is taken and on this three needles are threaded and arranged at equal distances. The middle needle is inserted through the centre of the pile behind the clamp; the lateral needles divide the remaining distance (see Fig. 1). When the needles are pulled through, four loops are formed and tied off as four mattress sutures (see Figs. 2 & 3).

The pile, external to the clamp, is cut away with scissors and the clamp removed. The advantages claimed for this method are:—

- (1) It is very rapid.
- (2) It is a bloodless operation. No time is wasted catching bleeding vessels.
- (3) The scar produced is linear in the long axis of the bowel, thereby reducing constriction to a minimum.
- (4) The patients are comfortable after operation.
- (5) The late after-results are uniformly satisfactory.

In concluding these somewhat random notes, I must express my thanks to Mr. Gernon, Assistant Surgeon, for help in obtaining records, etc., and my great indebtedness to Lieut.-Col. Bowle Evans, C.M.G., I.M.S., late S.M.O., Dehra Dun, not only for permission to publish these notes, but for his never-failing courtesy and help throughout the period of his able administration.

## CASES OF LEPROSY IN THE BANGKOK MAIN PRISON TREATED WITH SODIUM GYNOCARDATE AND SODIUM GYNOCARDATE "A."

By DR. M. CARTHEW, M.D.,

Medical Officer, Local Sanitary Department, Bangkok, Siam.

THESE cases were treated from April, 1917, till November, 1917, with sodium gynocardate intravenously and by the mouth in the manner

before described\*. After that date till the present time they have been treated with sodium gynocardate "A" intravenously and by the mouth, as the manufacture of sodium gynocardate had ceased.

On a few occasions, and for short periods while the veins were blocked, the drug was injected subcutaneously.

Either one drug or the other has been administered practically continually, but on a few occasions the drug had to be stopped for a few days owing to reactions or some ordinary illness on the part of the patient, and also difficulty in obtaining the drug from India.

In only one single case has there been a severe reaction.

### Case 1:—

**Condition, April, 1917.**—Duration of leprosy, 6 years; time in prison, 2 years. A raised, red macular thickening of the skin over the whole body, there being but few places not affected. These maculae are dark-red in colour with raised thickened margins.

On back and front of both thighs are large maculae, pale in the centre. These are markedly anæsthetic. There is complete anæsthesia of both legs and feet from 6" above the ankles downwards. Complete anæsthesia of the right hand, of left shoulder, arm and left hand.

Partial anæsthesia over the facial maculae and over some of those on the body.

The ulnar nerve on both sides is markedly indurated.

**Bacteriological examination of the nose.**—Negative.

**Diagnosis.**—Maculo-anæsthetic leprosy.

**Condition, April, 1918.**—The macular thickening over the body has largely disappeared, only faint traces remaining on the abdomen. The large maculae, with pale centres, on the back of the thighs have entirely disappeared, those on the face have entirely disappeared.

Anæsthesia has almost entirely disappeared from all situations affected. The patient is now sensible to scratching, pinching and stroking, whilst a year ago he was insensible to the prick of a pin.

No reactions have occurred in this patient.

**Result.**—Lesions very much improved.

**Case 2.**—See No. 23264: Chinese.

**Condition, April, 1917.**—The patient is suffering from syphilis, tuberculosis and leprosy.

The patient has had leprosy 2 years, has been in prison 3 years, therefore it looks as if he were infected in the prison.

The patient has a tubercular thickening of the lobes of both ears.

His whole body and face is covered with small, dark-red maculae. There is a scaly dermatitis on knees, shins, feet, and elbows. Trophic ulceration of the sole of the right foot.

Complete anæsthesia of right leg from knee to toes. Anæsthesia of outside of left foot. All the anæsthetic areas being insensible to prick of pin.

**Bacteriological examination of nose.**—Positive.

**Diagnosis.**—Maculo-anæsthetic leprosy.

**Condition, April, 1918.**—All maculae have disappeared, only a faint trace of the dermatitis on the shin bones.

The trophic ulcer of the foot has healed, the thickening of the ears has disappeared.

Anæsthesia has much improved, his skin is now sensible to the prick of a pin, but in a few places is still insensible to stroking.

**Reactions.**—He had the usual mild reactions. He could not take such large doses by the mouth as the other patients as such doses gave him gastric dyspepsia.

\* See Indian Medical Gazette, March 1918, p. 98.

Treatment had frequently to be omitted owing to blocking of the veins.

*Result*—Lesions considerably improved. In considering this question the concomitant diseases of syphilis and tuberculosis must be taken into account, especially as they were untreated, as far as I could make out.

*Condition, April, 1917.*—The patient has had leprosy for one year. He has been in prison six years, therefore it appears that he was infected in the prison.

The patient has macule on the face, both arms, both legs, chest and back.

Anæsthesia of the inner half of right thigh and all the right leg and foot.

Anæsthesia of left foot, both hands, both ears and both cheeks.

Both ulnar nerves are much thickened.

*Bacteriological examination of nose*—Positive.

*Diagnosis*—Maculo-anæsthetic leprosy.

*Condition, June, 1918.*—This patient has not been injected for four months, as he has been in hospital with multiple abscesses in the buttocks, which had nothing to do with previous injections. He has, however, been taking the drug by the mouth, gr. 80 per day, and for the past ten days has shown a reaction in the shape of the maculæ which had disappeared having reappeared, but with greatly increased redness and fresh redness and swelling of hands and feet, pains, etc.

Anæsthesia disappeared from right thigh and improved in right leg. No change in right foot.

Anæsthesia still present in left foot, fingers of right and left hands, partial anæsthesia of cheeks, no anæsthesia of ears.

*Result*—Some lesions improved, but as he at present is suffering from a reaction, it is difficult to judge of the extent.

*Condition, July 20th, 1918.*—All reactionary symptoms have disappeared, and the maculæ have almost entirely disappeared, only faint traces remaining.

Remaining anæsthetic patches seem to be slightly improved.

*Condition, April, 1917.*—He has been in prison for 14 years and has only had leprosy for 8 years, therefore it appears that he was infected in the prison.

This is a typical, well-marked face of mixed leprosy with well-marked, leonine face, and erosion of nasal bones. Tubercles on ears, neck, chin, eye-brows.

Anæsthesia all round the neck but complete anæsthesia on left side of neck. Anæsthesia of hand, arms, legs and feet.

Trophic ulcers on the soles of both feet.

*Bacteriological examination of nose*—Positive.

*Diagnosis*—Mixed leprosy.

*Condition, April, 1918.*—The leonine appearance of the face has returned as far as possible to the normal. There is still disfigurement but it is due to the scarring left, the ears are normal.

The trophic ulcers of the feet have disappeared. The anæsthesia has completely disappeared.

*Result*—Complete disappearance of lesions.

*Condition, April, 1917.*—He has had leprosy for 5 years and has been in prison for 2 years.

His whole body is covered with tubercles of varying sizes, clustered and single, from the size of a pea to a pigeon's egg.

There are maculæ accompanied by dermatitis on both arms. There is complete anæsthesia of both legs and feet, arms and hands.

*Bacteriological examination of nose*—Positive.

*Diagnosis*—Mixed leprosy.

*Condition, April, 1918.*—This patient has shown not the slightest improvement and his condition is almost identical with that in April, 1917. He takes the drug in large doses badly, showing the toxic symptoms described. Reactions are frequent and severe.

*Result*—No improvement.

*Condition, April, 1917.*—He has been in prison 5 months and has suffered from leprosy for 1 year.

He has two large maculæ on right thigh with pale centres and red margins, there are several small pale maculæ on his left arm. Maculæ on his face. All these maculæ showed complete anæsthesia. He has complete anæsthesia of his hands and feet. He has a trophic ulcer on the point of his left elbow and another at the base of the great toe on the right foot.

Bacteriological examination of the nose shows an extraordinary number of lepra bacilli, chiefly in clumps.

*Diagnosis*—Maculo-anæsthetic leprosy.

*Condition, April, 1918.*—All maculæ have completely disappeared, and the patient seems to have completely returned to the normal with the exception that his great toe was amputated and the wound is not quite healed. The anæsthesia has completely disappeared, the ulcer at point of left elbow has healed. This patient is taking the maximum dose of sodium gynocardate "A," i. e., gr. 5 intravenously (10 c. c.) three times a week and gr. 40, by month, daily.

*Result*—Complete disappearance of all lesions.

*Condition, April, 1917.*—Patient has had leprosy two years, and has been in prison for three years, so that it appears that he has been infected in prison.

His body and face are covered with red maculæ of varying sizes; some have pale centres. There is an extensive dermatitis of both legs and feet and arms. The hair has fallen out of both eyebrows and eyelashes are very scanty. Ptosis of the left eyelid.

Absolute anæsthesia of both arms, hands, legs and feet.

*Bacteriological examination of nose*—Positive.

*Diagnosis*—Maculo-anæsthetic leprosy.

*Condition, April, 1918.*—The small scattered maculæ have all disappeared with the exception of one or two remaining faint red marks on back and belly.

The dermatitis is much improved except over one shinbone where it is in the same condition as a year ago. Eyelashes now are normal. Eyebrows have grown and moustache and beard now growing freely. Anæsthesia of both legs and feet is improved but not yet normal, i. e., he can feel pinching but not stroking only. Feet remain partially anæsthetic. Anæsthesia of hands and arms has completely disappeared with the exception of one small spot on left outer arm below elbow where a fresh reactionary swelling seems to be just breaking out. His general health is now normal, he now never suffers from acute joint pains.

*Result*—Considerable improvement.

*Condition, October, 1917.*—Patient has had leprosy 15 years. He has been in prison seven years, and during that time has not been isolated till eight months ago.

The patient's whole body and face are covered with disseminated tubercles. There are dark-red maculæ (almost black) on face, chest, back and right lower leg. These have distinctly raised margins. There is a large dark-red macule on back with raised edges shewing extensive scaly dermatitis. Complete anæsthesia of all abovementioned maculæ, also of outer side of right foot, inner side of left foot and right wrist.

*Diagnosis*—Mixed leprosy.

*Condition, April, 1918, i. e., after seven months' treatment*—All tubercles have completely disappeared, the dermatitis has almost completely disappeared but not all, the macular thickening of maculæ on face much reduced in size and almost of normal colour with two exceptions.

*Anæsthesia*—Sensation has returned in all maculæ with the exception of a small 2-inch patch on back and a similar patch on the outside of the right foot. The patient's general health has much improved.

*Results*—Lesions very markedly improved.

*Condition, October, 1917.*—Patient has had leprosy for 20 years and has been in prison for one year.

There are two large pale maculæ covering a large part of both thighs and extending down below the knee-joints. There are pale-coloured maculæ on chest, face and both arms. Retraction of left hand.

Complete anæsthesia of all maculæ. Anæsthesia of both hands, legs and feet.

*Diagnosis*—Maculo-anæsthetic leprosy.

*Condition, April, 1918, i.e., after seven months' treatment.*—Maculæ have markedly returned towards normal skin-colour though those on thighs are still quite evident.

No anæsthesia of body, face or hands but partial anæsthesia, i.e., can feel pinching but not stroking where formerly he could not feel the prick of a pin, still remains from the thigh to the feet.

*Results*—Considerable improvement.

*Condition, October, 1917.*—He has been in prison 2 years and has only had leprosy for 1 year, therefore it appears as if he had been infected while in prison.

He has a small red macula on nose, small maculæ on both forearms and one on back of left thigh. Dermatitis of both arms, both legs and feet, but most marked on right thigh.

Complete anæsthesia in all maculæ, anæsthesia of both hands and feet.

*Diagnosis*—Maculo-anæsthetic leprosy.

*Condition, April, 1918.*—All anæsthesia has disappeared with the exception of that of both feet. The maculæ on the face and arms have disappeared. Maculæ on back of thigh still evident.

Dermatitis has disappeared from his arms but is still present on his legs, though much improved.

The patient has many syphilitic scars on his body, which somewhat reduce the value of the photos.

*Result*—Considerable improvement.

*Condition, November, 1917.*—The patient has been in prison for 2 years and 9 months. He has only had leprosy for 1 year and 3 months, therefore it appears as if he were infected in the prison.

He has dark-red maculæ on face, arms, left scapular region, thighs and legs. All are completely anæsthetic.

Dermatitis on both arms, left thigh, left leg and both feet.

Anæsthesia of left leg and foot, and also of both hands.

*Diagnosis*—Maculo-anæsthetic leprosy.

*Condition, April, 1918 (6 months' treatment).*—Almost complete return of normal sensation. The dermatitis has disappeared.

The maculæ have disappeared in places and now only show on the face and right arm, though much improved.

*Result*—Considerable improvement.

*Condition, November, 1917.*—He has been in prison for 1 year and has had leprosy for two years.

He has disseminated tubercles on his face, arms and body.

Anæsthesia of left foot and ring-finger of left hand.

*Diagnosis*—Mixed leprosy.

*Condition, April, 1918.*—The tubercles have completely disappeared from the body, a few still remain on the arms and face, the latter being markedly reduced in size.

Anæsthesia has completely disappeared.

*Result*—Considerable improvement.

*Condition, February, 1918.*—Patient has been in prison for 5 years and has only had leprosy for 2 years, therefore it appears as if he were infected in prison.

He has small red maculæ on both cheeks, on thorax and abdomen, which are very slightly anæsthetic. There is complete anæsthesia of fourth toe of right foot.

*Diagnosis*—Maculo-anæsthetic leprosy.

*Condition, June, 1918.*—The maculæ have entirely disappeared and the only remaining symptom is the anæsthesia of fourth toe which now is only partial, i.e., he can feel it when the skin is pinched.

*Result*—Marked improvement.

#### CONCLUSIONS.

1. Of these 13 cases, 7 cases have only shown the symptoms of leprosy some time after being imprisoned, therefore it appears as if they were infected in the prison, especially as no method of isolation was employed and as the prison has contained lepers for many years past.

2. Maculo-anæsthetic ... 9 cases.  
Mixed leprosy ... 4 „

3. All lesions disappeared ... 2 cases.  
Very marked improvement ... 3 „  
Considerable improvement ... 6 „  
Improvement ... 1 case.  
No improvement ... 1 „

Total ... 13 cases.

4. Neither the duration of the disease nor the type of the disease seems to have any marked influence on the rapidity of the improvement. The cases showing most rapid change being—

Case No. 4, with duration of disease 8 years, mixed leprosy.

Case No. 6, duration of disease 6 months, anæsthetic leprosy.

Case No. 8, duration of disease 15 years, mixed leprosy.

5. In my opinion, the relief granted to the patient by the improvement of his general health, together with the almost universal improvement of the symptoms of the disease, indicate that the treatment by sodium gynocardate A is indicated in all cases of leprosy of whatever type or duration. And that although it is still too early to state definitely that the treatment is specific and curative, the results already obtained strongly indicate that happy result.

#### THE ETIOLOGY OF SPRUE.

BY LUCIUS NICHOLLS, B.A., B.C., M.D. (Cantab.),  
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SPRUE is among the "Tropical Diseases" of which the etiologies are unknown; and a variety of causes of this disease have been suggested.

Success is more probable, when seeking for the causal organism of a chronic disease, from a study of it during its onset in each patient before the disease has progressed and lowered the resistance of the body which will favour the appearance of secondary organisms, or when the disease occurs in its aberrant forms.

Kohlbrugge (1) was the first to record that yeasts may appear in large numbers in the alimentary



tract of patients who are suffering with sprue. Many observers have noted this presence of yeasts, but the suggestion that these organisms play a principal part in the etiology of this disease has received enhanced attention since Bahr (2) published his "Report on Researches on Sprue in Ceylon." But probably these organisms grow in the stools after a primary cause has weakened the digestive and absorptive functions of the alimentary system, and this allows the accumulation in the intestines of a large amount of suitable pabulum for the growth of the yeasts.

The normal bacterial *fauna* of the fæces is altered in most diseases of the intestines, and this is particularly well marked in such acute diseases as typhoid and dysentery, where the usual preponderance of lactose-fermenting organisms has been replaced by the time the patient commences convalescence by members of the alkaligenes or proteus groups, and this is due to an alteration in the intestinal contents and not to a change in the resistance of the body.

The essential feature of sprue may be defined as a superficial inflammation and erosion of the mucous membrane of the whole alimentary tract, which gradually leads to profound degeneration of the entire digestive system.

It is logical to consider that the changes which occur in the mouth, pharynx and œsophagus are of the same nature, and have the same cause as those which take place in the lower parts of the alimentary tract.

There is an exceedingly common form of superficial glossitis and œsophagitis among the native population of Ceylon, which more frequently afflicts women than men; a number of these cases can always be seen at the out-patients' department of the Women's Hospital in Colombo. The patient complains of a sensation as though cayenne-pepper were held in the mouth, and almost all explain that this pain extends backwards, and the food produces a feeling of scalding as it is passing down the gullet.

The tongue has a smooth, clean, glazed appearance, and there are areas of very superficial ulceration.

The condition is exactly similar to that seen in Europeans who are suffering from typical sprue. These native patients seldom complain of diarrhœa, and the voluminous frothy stool, usual with Europeans, is practically always absent.

I conclude that, due to racial immunity, sprue, though common, is a mild affection among the natives of Ceylon, and seldom produces symptoms referable to any portion of the alimentary tract lower than the œsophagus.

The disease usually is manifested in Europeans by changes throughout the alimentary tract; yet one part may be more affected than another, for

cases are not uncommon in which tongue symptoms are absent, and others in which the sore mouth is the only symptom present.

In the majority of these cases in natives and in six out of eleven European patients, I have failed to grow yeasts in culture media which had been inoculated with scrapings from the tongue and mouth.

The only organisms which I have succeeded in isolating on every occasion have been streptococci.

Sprue occasionally has a sudden onset, and the patient is able to state the day or even hour on which the first symptoms appeared.

I can record two striking examples of this—the first patient was a person who knew that I was studying Ceylon sore mouth; he visited me one day because he had an attack of sprue which started that morning; the previous night he had been in perfect health; but that morning when he went to breakfast, he found that he could not eat with comfort because of a burning sensation as though he had cayenne-pepper in his mouth, and also he could not smoke. His tongue was very red but clean, and when examined with a lens there appeared to be very superficial congestion and shredding of the mucous membrane. I cleaned a small portion of the tongue and mucous membrane of the cheek with alcohol, and from scrapings of these areas I inoculated tubes and plates of glucose-agar, glycerine-agar and blood-agar. There appeared on these media numerous colonies of streptococci of the "viridans" group, a few isolated colonies of other organisms, but no yeasts.

This patient soon developed other symptoms of sprue and within a week the stools were numerous, large and frothy.

A second patient, when he was staying in the hills last September, experienced a similar onset, he states that he was in very good health, when on a definite date he found that he could not eat his meals, or drink a whiskey and soda, on account of the sudden appearance of soreness in his mouth; the next day he had diarrhœa, and in a few days he passed typical sprue stools.

I did not see this patient at that time, so I was unable to obtain cultures as had been done in the previous case.

I have been able to obtain only one *post-mortem* examination on a patient who had died of sprue. The deceased was a woman, and the examination was made within a few hours of death. I obtained a large number of colonies of streptococcus viridans on glycerine-agar and blood-agar from the tongue, œsophagus, duodenum, ileum, colon, spleen and liver.

I can find articles from only one observer who previously has suggested that sprue may be a streptococcal infection. Sir Leonard Rogers has made this suggestion in the *Lancet* (June 6th, 1914) after the successful treatment of two

patients with a vaccine of streptococci which had been isolated from their mouths.

Streptococci can be isolated from the mouths of the majority of persons in normal health, and any claim that they are the cause of a disease requires considerable substantiation.

It is very necessary to attempt to define the characters of the streptococcus associated with sprue; and this raises the vexed question whether or not the organisms of this class, which are found in etiological relationship with so many and various diseases, can be described satisfactorily.

Various morphological, cultural and serological tests have been suggested to distinguish the different types of streptococci. I will discuss them and apply them to the organisms under consideration.

*Morphological.*—All bacteriologists are now agreed that it is hopeless to differentiate between various streptococci from their microscopical appearances, for the organism can be altered from long to short chain forms by changing the composition of the culture media.

When first isolated on blood-agar, the chains of the streptococci from sprue patients were short or of moderate length, occasionally long forms appeared in the first culture in glycerine broth, but after several subcultures in this media the chains were long or conglomerated in all cases. I could find no capsule around these organisms when stained by Buerger's method, which has been used for distinguishing the pneumococcus and streptococcus mucosus.

*Bile test.*—When fresh and filtered ox bile is added to broth cultures of most strains of pneumococci and certain streptococci, they swell up and are dissolved. This action did not take place with the organisms under consideration.

*Cultural characters.*—The best primary grouping of streptococci as they occur in association with man, is that suggested by Schöttmüller, which is based upon the characters of their colonies on blood-agar plates:—

1. Colonies which are surrounded by a clear zone of hæmolysis:—streptococcus hæmolyticus (seu pyogenes, seu erysipelatos).

2. Colonies of a greenish colour and usually no zone of hæmolysis:—streptococcus viridans (seu mitior).

3. Whitish colonies of a slimy consistence, they tend to adhere to the media, and the cocci are capsulated:—streptococcus mucosus.

The organism from sprue patients produces green colonies and no hæmolysis, and is therefore a strain of streptococcus viridans.

*Precipitation test*—Some organisms when growing on ascitic agar produce a cloudiness in the media in the neighbourhood of their growth; this is due to the precipitation of the proteids of the ascitic fluid; when others are growing on this

media it remains clear and transparent. This is known as the precipitation test and it is considered a very distinctive test by some workers. In my hands the test has varied and streptococci have produced precipitation with one lot of ascitic fluid and failed to do so with ascitic fluid from another source. Also this test is one of degree, one streptococcus will produce a deep opacity throughout the whole ascitic agar slope, while with another the opacity will occur only in the neighbourhood of the growth.

Most of the "sprue" organisms have produced a greater or less degree of precipitation.

*Carbohydrate fermentation.*—Numerous efforts have been made to classify streptococci by their actions on carbohydrates; Gordon and Houston (3) were among the first to study these reactions, but in none of their reports is a satisfactory classification suggested, even though the organisms came from such different sources as cow-dung and human stools. Andrewes and Horder (4) studied 288 strains and they divided them into the following types:—streptococcus equinus, streptococcus mitis, streptococcus pyogenes, streptococcus salivarius, streptococcus anginosus, streptococcus faecalis and pneumococcus.

The numerous  $\pm$  symbols appearing in their tables show how frequently they found that the reactions varied; they frankly admit that one group insensibly fades into another and they state: "We venture to believe that some such conception of the streptococci, as we have set forth, is preferable to the idea that they are all one kind and that they present a hopeless chaos."

Hopkins and Arvilla Lang (5) from a study of 105 strains propose the following groups:—

- (a) Pyogenic group, characterised by the fermentation of lactose and salacin.

- (b) Four salivary groups, two characterised by the fermentation of raffinose, one by the fermentation of inulin and one by the failure to ferment salacin, raffinose, mannite or inulin.

- (c) Faecal group, characterised by the fermentation of mannite.

- (d) Equine group, characterised by the failure to ferment lactose.

The reactions produced by the streptococci from patients suffering from sprue were very variable, but none of them fermented mannite in the serum water of Hiss.

The accompanying charts, in which the cultural characters are given, demonstrate the inconstancy of their reactions, partly depending upon the media used, whether serum water or lemco broth. The reactions of some of the organisms have been tested at intervals after they have been subcultured weekly for several months, and reference to the charts shows that frequently they lose the power of splitting certain carbohydrates after repeatedly being subcultured.

When these tests were carried out on the same date, on all occasions portions of the same lot of media were used for each organism.

The reaction of several streptococci isolated from other sources is given in these charts for comparison.

I have isolated a streptococcus on several occasions which produced acid from all the nineteen carbohydrates noted, the carbohydrates being added in 1 per cent. strength to sugar-free lemco broth, a tube containing no added carbohydrate is inoculated for a control, but this organism belongs to the viridans group and produces no acidity from mannite and many other sugars when these are dissolved in the serum water of Hiss.

It is interesting to note how it slowly loses its power of producing acid from such substances as adonite, inosite, and inulin after it has been subcultured.

In these tests adequate controls were made, thus a recently isolated streptococcus which produced acid in all the media was controlled by one which had had this property but had lost it in respect to certain carbohydrates.

This particular streptococcus has been isolated from two cases of ulcerative endocarditis by blood culture, once from a skin disease, twice from cases of sprue and on two or three occasions from stools, and although at the time of isolation it had distinctive characters, after a few subcultures it became indistinguishable from streptococcus viridans which may be cultured from the healthy mouth.

I do not consider that the fermentation tests are of value for more than roughly grouping the strains of streptococci. To summarise therefore: the streptococci isolated from cases of sprue do not possess a capsule, they are non-hæmolytic, they are not lysed by ox bile, they do not produce acid from mannite in the serum water of Hiss and they produce green colonies on blood-agar. Indeed culturally they are indistinguishable from the streptococcus viridans of the normal mouth.

*Serological tests.*—Attempts have been made to base the relation of streptococci to disease upon their specific agglutination reaction. Baginshy and Sommerfield(6) found that the serum of patients who had scarlet fever contained specific agglutination for streptococci isolated from the throats of such patients.

Similar findings have been reported by Von Pirquet(7). Meyer(8) found that when rabbits were immunised with four of ten strains that cross agglutination occurred with the other strains, but he states that organisms from purulent processes were not affected by the immune sera produced by organisms from the throats of scarlet fever patients or persons suffering with rheumatic fever. Other investigators have

reported promiscuous agglutination between various streptococci and immune sera; from this Marmorek(9) concluded that all human pathogenic streptococci were of the same species.

Fischer(10) concluded that the agglutination reaction was valueless for grouping streptococci.

I have tested the sera of sprue patients with the organisms isolated from their mouths but the results have been so irregular and indefinite that I could form no conclusions in these cases.

*The complement fixation test.*—This test has been studied for two purposes: to classify streptococci and to prove its etiological rôle in a number of diseases.

Floyd and Wolback(11) concluded that there was a marked degree of specificity in the complement fixation with immune sera for antigen of similar cultural and fermentation reactions. But Kinsella(12) could find no apparent relationship between complement fixation properties of streptococci grouped according to their carbohydrate fermentation reactions, but he was able roughly to classify these organisms into three groups; later Kinsella and Swift(13) by this test classified non-hæmolytic streptococci into three groups.

For the second purpose much work has been done in connection with scarlet fever patients with varying results; Livirato(14) tested the sera of scarlet fever patients using the streptococci isolated from their throats as antigen, and compared these results with those obtained when a number of antigens from other sources were used. All gave positive complement fixation with the former antigen and negative with the others. Foix and Müllein(15) report similar results.

Castex(16) used sera from patients suffering from various streptococcal infections and obtained cross immunity reactions with all and concluded that various streptococci do not produce antibodies sufficiently specific to distinguish the strain of organism or to decide from where any particular organism may have been isolated.

Major(17) isolated a streptococcus viridans from a patient suffering from endocarditis and showed that the serum contained specific antibodies but the serum also fixed a hæmolytic streptococcal antigen.

Hastings(18) studying the bacteria from arthritis deformans states that twelve out of twenty-four sera tested gave positive fixation with streptococcus viridans antigen.

Finally Aschner(19) found that the sera of patients with streptococcal endocarditis gave strongly positive fixation with homologous antigen, but a negative with a mixed antigen of streptococci isolated from throat and other lesions.

I have tested the sera of three patients who showed all the definite clinical symptoms of

# THE ETIOLOGY OF SPRUE.

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Chart of the Characters of Streptococci isolated from various sources. This demonstrates the impossibility of classifying them by their fermentation reaction. These are selected from a very large number which have been tested.

| LABORATORY<br>NUMBER<br>OF ORGANISM | FROM WHERE<br>ISOLATED | MORPHOLOGICAL<br>APPEARANCE IN<br>GLYCERINE BROTH | APPEARANCE OF<br>COLONY IN BLOOD<br>AGAR | BILE TEST | PRECIPITATION TEST | DATE OF<br>CARBOHYDRATE TESTS | MEDIA USED IN<br>CARBOHYDRATE TESTS | LACTOSE | SACCHAROSE | DULCITE | ADONITE        | INDSITE | INULIN         | SALACIN        | RAFFINOSE      | DEXTRINE       | ARABINOSE      | SORBITE        | ISODULCITE     | AMYGDALINE     | ERYTHRITE      | GLYCERINE | MANNITE        | MALTOSE | GALACTOSE | LAEVULOSE | GLUCOSE | INDOLE | V. AND P. | NEUT. RED | REDN. NITRATE |
|-------------------------------------|------------------------|---|--|-----------|--------------------|-------------------------------|-------------------------------------|---------|------------|---------|----------------|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------|----------------|---------|-----------|-----------|---------|--------|-----------|-----------|---------------|
| 361                                 | SKIN ULCERATION        | LONG CHAINS                                       | GREEN.                                   | 0         | +                  | 4/6/7                         | LEMCO<br>BROTH                      | A       | A          | A       | A              | A       | A              | A              | A              | A              | A              | A              | A              | A              | A              | A         | A              | A       | A         | A         | A       | 0      | 0         | ?         |               |
| 361                                 | "                      | "   | "  | "         | "                  | 6/8/17                        | LEMCO<br>BROTH                      | A       | A          | A       | A              | A       | A              | A              | 0              | A              | A              | A              | A              | A              | A              | 0         | A              | A       | A         | A         | A       | 0      | 0         | 0         | +             |
| 361                                 | "                      | "   | "  | "         | "                  | 17/5/18                       | "                                   | A       | A          | A       | A              | A       | A              | A              | 0              | 0              | A <sup>S</sup> | A <sup>S</sup> | A <sup>S</sup> | A <sup>S</sup> | A              | 0         | 0              | A       | A         | A         | 0       | 0      | 0         | +         |               |
| 361                                 | "                      | "   | "  | "         | "                  | 30/5/18                       | SERUM<br>WATER                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | A <sup>S</sup> | A <sup>S</sup> | A <sup>S</sup> | A <sup>S</sup> | A              | 0         | 0              | A       | A         | A         | 0       | 0      | 0         | +         |               |
| 301A                                | ENDOCARDITIS           | "   | "  | "         | +                  | 4/6/17                        | LEMCO<br>BROTH                      | A       | A          | A       | A              | A       | A              | A              | A              | A              | A              | A              | A              | A              | A              | A         | A              | A       | A         | A         | 0       | 0      | 0         | 0         |               |
| 301A                                | "                      | "   | "  | "         | "                  | 4/2/18                        | "                                   | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | A <sup>S</sup> | 0              | 0         | A              | A       | A         | A         | 0       | 0      | 0         | 0         |               |
| 689A                                | SPRUE MOUTH            | "   | "  | "         | +                  | 15/6/18                       | LEMCO<br>BROTH                      | A       | A          | A       | A              | A       | A              | A              | A              | A              | A              | A              | A              | A              | A              | A         | A              | A       | A         | A         | 0       | 0      | 0         | 0         |               |
| 689A                                | "                      | "   | "  | "         | +                  | 25/7/18                       | SERUM<br>WATER                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 689A                                | "                      | "   | "  | "         | +                  | 26/7/18                       | SERUM<br>WATER                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 100                                 | DYSENTERY.             | "   | "  | "         | +                  | —                             | SERUM<br>WATER                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | A <sup>S</sup> | 0              | 0              | 0              | 0              | 0         | A <sup>S</sup> | A       | A         | A         | 0       | 0      | 0         | 0         |               |
| 633                                 | PUS                    | SHORT CHAINS                                      | HÆMOLYSIS                                | "         | +                  | —                             | LEMCO<br>BROTH                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 669                                 | MOUTH                  | "   | "  | "         | +                  | 2/7/18                        | SERUM<br>WATER                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 673                                 | NORMAL MOUTH           | LONG CHAINS                                       | GREEN                                    | "         | +                  | 18/6/18                       | LEMCO<br>BROTH                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 673                                 | "                      | "   | "  | "         | +                  | 2/7/18                        | SERUM<br>WATER                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| X                                   | SEPTIC TOOTH           | "   | "  | "         | +                  | 2/7/18                        | "                                   | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 631                                 | PYRRHOEA               | SHORT CHAINS                                      | "  | "         | +                  | 30/5/18                       | "                                   | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | A <sup>S</sup> | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 632                                 | "                      | LONG CHAINS                                       | "  | "         | 0                  | 30/5/18                       | "                                   | A       | A          | 0       | A <sup>S</sup> | 0       | A <sup>S</sup> | A <sup>S</sup> | 0              | A <sup>S</sup> | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 632                                 | "                      | "   | "  | "         | 0                  | 17/5/18                       | LEMCO<br>BROTH                      | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 650                                 | "                      | "   | "  | "         | +                  | 17/5/18                       | "                                   | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 663                                 | PUS                    | SHORT CHAINS                                      | WHITE COLONY                             | "         | +                  | 17/5/18                       | "                                   | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 408                                 | LIVER P. M.            | MODERATE LENGTH                                   | GREEN                                    | "         | +                  | 17/5/18                       | "                                   | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 408                                 | LIVER P. M.            | "   | "  | "         | +                  | 30/5/18                       | SERUM<br>WATER                      | A       | A          | 0       | 0              | 0       | 0              | 0              | A <sup>S</sup> | 0              | A <sup>S</sup> | 0              | A <sup>S</sup> | 0              | A <sup>S</sup> | 0         | A              | A       | A         | A         | 0       | 0      | 0         | 0         |               |
| 667                                 | NORMAL MOUTH           | "   | "  | "         | +                  | 30/5/18                       | "                                   | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |
| 669                                 | "                      | "   | "  | "         | +                  | 30/5/18                       | "                                   | A       | A          | 0       | 0              | 0       | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0         | 0              | 0       | A         | A         | 0       | 0      | 0         | 0         |               |

A==ACID.  
O==NO CHANGE.

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### Chart of the Characters of the Streptococci isolated from the mouths of patients suffering from Sprue.

| LABORATORY<br>NUMBER<br>OF ORGANISM | FROM WHERE<br>ISOLATED. | MORPHOLOGICAL<br>APPEARANCE IN<br>GLYCERINE BROTH | APPEARANCE OF<br>COLONY IN BLOOD<br>AGAR. | BILE TEST. | PRECIPITATION TEST. | DATE OF<br>CARBOHYDRATE TESTS | MEDIA USED IN<br>CARBOHYDRATE TESTS | LACTOSE | SACCHAROSE | DULCITE | ADONITE | INOSITE | INULIN | SALICIN        | RAFFINOSE      | DEXTRINE | ARABINOSE | SORBITE | ISODULCITE | AMYGDALINE | ERYTHRITTE | GLYCERINE | MANNITE | MALTOSE | GALACTOSE | LAEVULOSE | GLUCOSE | INDOLE | V. AND P. | NEUT. RED | REDN. NITRATE |
|-------------------------------------|-------------------------|---|---|------------|---------------------|-------------------------------|-------------------------------------|---------|------------|---------|---------|---------|--------|----------------|----------------|----------|-----------|---------|------------|------------|------------|-----------|---------|---------|-----------|-----------|---------|--------|-----------|-----------|---------------|
| 94                                  | SPRUE MOUTH             | LONG CHAIN  | LOST GREEN *                              | 0          | 0                   | 17/5/18.                      | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | 0              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 639                                 | SPRUE MOUTH             | MODERATE CHAIN                                    | GREEN                                     | 0          | +                   | 7/3/18.                       | SERUM<br>WATER.                     | A       | A          | 0       | 0       | 0       | 0      | A              | A              | A        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 639                                 | "                       | "   | "   | "          | "                   | 17/5/18.                      | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | 0              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 644                                 | SPRUE MOUTH             | LONG CHAINS                                       | GREEN                                     | "          | 0                   | 7/3/18.                       | SERUM<br>WATER                      | A       | A          | 0       | 0       | 0       | 0      | 0              | A              | A        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 644                                 | "                       | "   | "   | "          | 0                   | 30/5/18.                      | "                                   | A       | A          | 0       | 0       | 0       | 0      | A              | A <sup>s</sup> | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 648                                 | "                       | VERY LONG CHAINS                                  | GREEN                                     | "          | ±                   | 7/3/18.                       | SERUM<br>WATER.                     | A       | A          | 0       | 0       | 0       | 0      | 0              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 648                                 | "                       | "   | "   | "          | ±                   | 17/5/18.                      | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | A              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 648                                 | "                       | "   | "   | "          | ±                   | 30/5/18.                      | SERUM<br>WATER.                     | A       | A          | 0       | 0       | 0       | 0      | 0              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 661                                 | "                       | LONG CHAINS                                       | " *                                       | "          | ±                   | 7/3/18.                       | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | A              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 661                                 | "                       | "   | "   | "          | ±                   | 17/5/18.                      | "                                   | A       | A          | 0       | 0       | 0       | 0      | A              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 661                                 | "                       | "   | "   | "          | ±                   | 30/5/18.                      | SERUM<br>WATER.                     | A       | A          | 0       | 0       | 0       | 0      | A <sup>s</sup> | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 641                                 | "                       | VERY LONG CHAINS                                  | " *                                       | "          | ±                   | 7/3/18.                       | "                                   | A       | A          | 0       | 0       | 0       | 0      | A              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 641                                 | "                       | VERY LONG CHAINS                                  | "   | "          | ±                   | 17/5/18.                      | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | A              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 660                                 | "                       | MODERATE LENGTH                                   | GREEN                                     | "          | ±                   | 7/3/18.                       | "                                   | A       | A          | 0       | 0       | 0       | 0      | 0              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 660                                 | "                       | "   | "   | "          | ±                   | 17/5/18.                      | "                                   | A       | A          | 0       | 0       | 0       | 0      | A <sup>s</sup> | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 660                                 | "                       | "   | "   | "          | ±                   | 30/5/18.                      | SERUM<br>WATER.                     | A       | A          | 0       | 0       | 0       | 0      | 0              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 630                                 | "                       | "   | GREEN AND<br>SLIGHT HÆMOLYSIS             | "          | ±                   | 25/7/18                       | "                                   | A       | A          | 0       | 0       | 0       | 0      | A <sup>s</sup> | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 630                                 | "                       | "   | "   | "          | ±                   | 25/7/18.                      | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | A <sup>s</sup> | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 687                                 | "                       | "   | GREEN                                     | "          | ±                   | 25/7/18.                      | SERUM<br>WATER.                     | A       | A          | 0       | 0       | 0       | 0      | 0              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 687                                 | "                       | "   | "   | "          | ±                   | 27/7/18.                      | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | A <sup>s</sup> | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 688                                 | "                       | "   | GREEN                                     | "          | ±                   | 25/7/18.                      | SERUM<br>WATER.                     | A       | A          | 0       | 0       | 0       | 0      | A              | A <sup>s</sup> | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 688                                 | "                       | "   | "   | "          | ±                   | 27/7/18.                      | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | A <sup>s</sup> | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 689                                 | "                       | "   | GREEN                                     | "          | ±                   | 25/7/18.                      | SERUM<br>WATER.                     | A       | A          | 0       | 0       | 0       | 0      | A <sup>s</sup> | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |
| 689                                 | "                       | "   | "   | "          | ±                   | 27/7/18.                      | LEMCO<br>BROTH.                     | A       | A          | 0       | 0       | 0       | 0      | A              | 0              | 0        | 0         | 0       | 0          | 0          | 0          | 0         | 0       | 0       | 0         | 0         | 0       | 0      | 0         | 0         | 0             |

\* LOST GREEN PRODUCTION AFTER REPEATED SUBCULTURES.  
 A=ACID.  
 O=NO CHANGE.



sprue, and sera from two persons in normal health were used for controls, the antigen, a streptococcus viridans grown from a tongue ulcer of one of the patients, was prepared by centrifuging a 48 hours culture of ascitic 0.5 per cent. glucose broth, the deposit was washed twice with normal saline and each time again thrown down in the centrifuge, suspensions of various dilutions were made from this and tested for anticomplementary action, and one-tenth of the highest dilution which produced anticomplementary action was used. The volumes used in the test were 0.3 c.c. each. The following table shows the results:—

| Amount of Patients' Serum. | 0.5 c.c. | 0.25 c.c. | 0.1 c.c. |
|----------------------------|----------|-----------|----------|
| 1st Patient ...            | 0        | ++        | +++      |
| 2nd Patient ..             | +        | ++        | +++      |
| 3rd Patient ..             | 0        | +         | ++       |
| 1st Normal person ...      | +++      | +++       | +++      |
| 2nd Normal person ...      | ++       | +++       | +++      |

0 No hæmolytic. + Slight hæmolytic. ++ Moderate hæmolytic. +++ Complete hæmolytic.

Thus 0.1 c.c. of the serum of patients suffering from sprue failed to fix the complement, whereas 0.5 c.c. produced complete fixation. Normal serum showed practically no power of fixing the complement.

*Action of streptococcal vaccines in sprue.*—Sir Leonard Rogers(25) in India has treated a number of patients with these vaccines, and although he makes no statement concerning the cultural characters of the organisms which he has used, as they were obtained from the mouth lesions, it is probable that they resemble those which I have dealt with above. The patients treated by him have included a number who were suffering from the disease in its advanced stages, and in all cases improvement resulted and in the majority there were complete cures.

I have now treated or have under treatment nine patients, and the results are so promising that I do not think that there is much doubt that they will be as satisfactory as with the patients of Sir Leonard Rogers, but it is too early to report definite results with the exception of the first three cases. Two of these were Europeans and the third was a Burgher.

I prepare the vaccine by growing the organism on an equal number of tubes of glycerine-agar and blood-agar, the growth is washed off the slopes and mixed.

The first injection consists of a dose of about 100,000,000 cocci, and this is repeated at intervals of five days, the number of cocci in each injection is gradually increased.

CASE 1.—A Burgher woman who had been suffering from sore mouth and frothy, fermenting, voluminous

stools for nine months. I prepared a vaccine from the streptococci of the mouth and injected increasing doses at intervals of five days; she stated that she noticed improvement from the commencement of treatment. By the time she had received six injections, her mouth appeared natural and the stools became smaller and less frequent. The improvement was maintained and at the end of the treatment her stools were normal.

CASE 2.—A male European who had been residing in India and had had a sore mouth and declining health for two years. For six months prior to treatment he had had attacks of diarrhoea and passed large, fermenting stools. He had lost 25 pounds in weight. Improvement commenced after the third injection and there were no signs of sore mouth after the fourth injection. He had remained in natural health for four months when I last heard from him.

CASE 3.—A male European who had been suffering from what was clinically a typical sprue sore mouth for over two years and had received numerous kinds of treatment. The mouth condition rapidly cleared up under the injections, and he was free from all symptoms for two months; at the end of this time, although there were no definite signs of recurrence, he requested a second course of twelve injections. These he had received and to the time of writing there has been no recurrence.

Results of these cases, and others which have only recently been treated, are such that I can state that I know of no other disease which responds so readily to vaccine treatment.

Most of the patients whom I have injected with vaccines have developed a curious ruddy areola around the site of injection; this may be a specific cutaneous reaction.

When the numerous articles are studied, which have recorded the large amount of work that has been done with streptococci, and it is realised that the results are inconstant and variable for the morphological, cultural and serological tests, it becomes necessary to hold very broad views of the nature of these organisms.

Several workers have stated that all streptococci from human sources are the same, but that they produce different cultural reactions according to the circumstances under which they are living or have recently lived.

Others believe that transmutations may take place in a short period of time. Thus Davis(20) writes "transformation of one member into another within certain limits appears to be not an uncommon phenomenon."

Rosenow(21) has shown that hæmolytic streptococci from a wide range of sources can be converted into streptococcus viridans, typical pneumococcus, and even into streptococcus mucosus, and further he demonstrates that this takes place even when the cultures are made from a single coccus according to the method of Barber, and thus working from a "pure line" he avoids "mass selection."

There are several possible sources of error in his work, but it would require too much space to discuss them here.

It is possible that bacteria can possess but a limited range of properties and that with them further evolution cannot take place, in which case we must assume that they show differences at different times because a varying number of these properties are dominant or recessive.

On the other hand, if they possess powers of evolution, it would be extraordinary if in a short time they did not give rise to fresh species, for a micro-organism which can divide once every half hour will soon produce a vast number of generations, and the study of evolution and palæontology shows that many forms of life have been evolved from more primitive species in many less generations than most bacteria are capable of producing in a year.

However, with pathogenic organisms, we are concerned principally with their virulence and elective affinities for various tissues, and we know that streptococci are able to acquire or lose these properties.

*Streptococcus viridans* indistinguishable for the organism from normal mouths frequently causes endocarditis, and if the organism from the healthy mucous membrane or from various lesions is injected into rabbits it sets up endocarditis, myositis, or arthritis.

Heineman has described two strains of streptococci isolated from milk indistinguishable from each other as to form, and cultural reactions which nevertheless were quite different as shown by intravenous injections into animals—one localised in the muscles and joints and the other in the gall bladder.

These organisms are ever ready to invade the body, and this is shown by their frequent presence in the organs at *post-mortem* on persons who have died from various causes.

Moody (22) has shown that streptococci from alveolar abscesses, which are identical morphologically and culturally, differ widely in their degree of virulence for laboratory animals.

Sprue is almost confined to thickly populated countries in which the climate is humid and warm. The majority of the inhabitants of Ceylon are addicted to the habit of chewing, this conduces to the repulsive habit of spitting and there is every chance of streptococci being continually passed from one person to another whose mouths have been irritated by the chew.

It is not unreasonable to suggest that in this manner streptococci may increase in virulence and acquire an elective affinity for the alimentary mucosa.

The disease pellagra has much in common with sprue, there is the same wasting of the organs and thinning of the walls of the alimentary tract, and sore mouth and intractable diarrhoea are well-marked symptoms. The suggestion that an error in diet has prepared the way for a streptococcal infection of the alimentary tract

will explain many factors associated with this disease.

Morpingo (23) and Koch (24) believed that scurvy was due to a streptococcal infection and numerous experiments carried out by them supported this opinion. Here, again, possibly the absence of a vitamine from the food renders the body incapable of resisting a streptococcal invasion.

Many military medical officers have noted when on campaign that the number of cases of scurvy can be reduced to almost a disappearing point by strict attention to mouth cleanliness among the troops (25).

I venture to suggest that these speculative views help to bring these diseases into line and indicate many experiments which should have valuable and interesting results.

Much of the work for the production of the charts on the fermentation reactions was done by my laboratory assistant, Mr. Richard de Silva.

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#### ON A NEW METHOD OF STANDARDIZATION OF DISINFECTANTS.

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OWING to the extensive use, in recent times, of disinfectants in zymotic diseases by the hospital authorities and by the general public, an increasing number of firms are bringing out, in the market, a large number of chemicals supposed to possess disinfecting properties. To distinguish the spurious from the true ones, as well as to find out the effective strength of the latter, is a problem of highest importance both from the point of economy and of safety. With this end in view, Rideal and Walker have formulated a test for standardizing disinfectants. This test depends on the principle of determining the lowest dilution

which suffices to kill, in a given time, a standard bacillus like the typhoid in comparison with the lowest dilution of a definite chemical like carbolic acid. As this test has been accepted by most of the bacteriologists of the world, a certain amount of uniformity has taken place in expressing the disinfecting powers of the various chemicals which are now in the market. Recently however, on account of stoppage of supply of Witte's peptone—an article essentially necessary for carrying out the test—a great amount of confusion and want of uniformity in the results obtained by this test have occurred. Had this discrepancy been confined to a small percentage, it would not have mattered much, but as a matter of fact the discrepancy amounts to something like 200 to 400 per cent. (one observer getting a co-efficient of 5 against 20 of another bacteriologist for the same disinfectant) and a large number do not like to make the test if they can help it. For this reason, a modification or a substitute of this test has become a necessity.

Recently I was experimenting with a modified Rideal-Walker test to find out the protozoa-killing power of a number of drugs like quinine, emetine, &c. In this I used as the test object a protozoa,\* instead of typhoid bacillus—the protozoa being selected by me on account of its possessing a peculiar property of growing vigorously in ordinary broth. In making the experiment, I was struck by the constant uniform results. I then extended the test to the ordinary bacteria-killing chemicals, like cyllin, hycol, etc., and as I got in this also the same uniform results, I felt justified in publishing my results.

The following is a description of the method adopted by me. A 24-hour culture of the protozoa is taken. A series of dilutions of the disinfectant to be tested is made. To a series of small (2 c.c.) test tubes .2 c.c. of the culture is placed and then .2 c.c. of the different dilutions of the chemical. After half an hour, .4 c.c. of diluted broth is added to each tube, and the whole kept overnight at room temperature. At the end of 24 hours, the contents of the tubes are examined under the low power of a microscope, and the lowest dilution showing no growth of the protozoa is noted. The rest of the dilutions, lower than this, should show a rich growth. Carbolic acid is tested in this way and its killing power is determined and a co-efficient is found by dividing the first figure by the latter. For example, the dilution of carbolic acid sufficing to kill the protozoa is found to be 200. If the disinfectant suffices to kill the protozoa in dilution 4000, the co-efficient is 20. In this way I found the carbolic co-efficients of several disinfectants which are in use, and give below a list of them, together with the R. W. co-efficient obtained by

testing against enteric bacillus. For obvious reasons, I omit the trade names of some of the chemicals.

| Disinfectant.              | Rideal-Walker co-efficient. | Co-efficient obtained by the new test. |
|----------------------------|-----------------------------|--|
| A—(1) Ordinary variety ... | 18                          | 20                                     |
| (2) Special variety ...    | 30                          | 25                                     |
| B—(1) Ordinary ...         | 18                          | 18                                     |
| (2) Special ...            | 20                          | 18                                     |
| Lysol ...                  | 2.5                         | 5                                      |
| Perchloride of mercury ... | 20                          | 30                                     |

I would like to mention that the co-efficients obtained by using this method is slightly higher than that obtained by R. W. test. But the main fact remains that those chemicals which show a high co-efficient with the Rideal-Walker test, show also a high co-efficient with the new method, and *vice versa*.

#### DISCUSSION.

As this test is dependent on the determination of the destroying power on protozoa, whereas all the disinfectants are used against bacteria, objection may be raised against the adoption of the test. But this objection cannot hold water, as the Rideal-Walker test is dependent on determining the killing power on a non-sporing bacillus, in artificial culture, whereas disinfectants are used against all kinds of bacteria, sporing and non-sporing, and under varying conditions which materially affect the disinfecting power, and which cannot be copied in laboratory experiments. The Rideal-Walker test is meant for giving a relative idea of power of a disinfectant in comparison with a definite chemical like carbolic acid and nothing more. So also will the new test give the same information, with much more definiteness. Besides, as the test can easily be carried out, the question of personal equation does not come into operation. The next point for consideration is the variations which are likely to occur on account of the variations in the several factors which come into play in performing the test, namely—

- (1) Variations in the culture of the protozoa.
- (2) Variations in the culture medium.
- (3) Variations in the time of exposure of the disinfectant in the test organism.

As regards the first point—regarding the test organism. This belongs to the species *prokawekia*. It was got by me about five years ago, from a sample of water and subsequently from the stool of a diarrhoea patient. It has been kept growing all this time. It has not suffered any change, by being kept growing in an artificial condition. It grows as vigorously as before in peptone bouillon.

Next, as regards the culture medium, I use ordinary nutrient broth diluted 1 in 4. Variations in the culture media showed no change in the co-efficient, so long the culture media used give a

\*A description of the protozoa has appeared in volume II, 1914, of the *Indian Journal of Medical Research*.

luxuriant growth. Now, this is a great advantage over the Rideal-Walker test, in which a special brand of peptone (Witte's) is necessary for carrying it out—and different concentrations of peptone give widely varying results. I give below the results obtained by using different brands and different concentrations of peptone in the Rideal-Walker test.

VARIATIONS IN THE RIDEAL-WALKER CO-EFFICIENT WITH TYPHOID BACILLUS, WITH THE SAME DISINFECTANT.

| *Brand of peptone.   | Concentration of peptone per litre. | Co-efficient obtained at one experiment. | Co-efficient obtained at 2nd experiment. |
|----------------------|-------------------------------------|--|--|
| Allen and Hanbury    | 20 grams ...                        | 3.80                                     | 5.5                                      |
| Foster and Bros. ... | 60 grams ...                        | 9.23                                     | 10.0                                     |
| May and Baker ...    | 20 grams ...                        | 20.00                                    | .....                                    |
| Original Witte ...   | 20 grams ...                        | 12.00                                    | .....                                    |
| Armour ...           | 20 grams ...                        | 21.18                                    | .....                                    |
|                      |                                     | 4.50                                     | .....                                    |

\* This table and other information regarding the wide variations which are obtained when the Rideal-Walker test is used with non-standardized peptone, are taken from a private communication on this subject made by a respectable firm of manufacturers of a well-known disinfectant, at whose instance several bacteriologists in England conducted the experiments to clear up the points. The name of the firm and of the bacteriologists have to be withheld, as I have no authority to publish them.

No comment is necessary on the above.

Now as regards the time limit, I found, after a series of experiments, that a certain amount of fallacy is likely to occur if a short time limit is

EXPOSURE TIME.

| Dilution used. | 2½ m. | 5 m. | 10 m. | 15 m. | 30 m. | 1 hr. | 2 hr. |
|----------------|-------|------|-------|-------|-------|-------|-------|
| 50             | +     | +    | +     | +     | +     | +     | +     |
| 100            | +     | +    | +     | +     | +     | +     | +     |
| 150            | +     | +    | +     | +     | +     | +     | +     |
| 200            | +     | +    | +     | +     | +     | +     | +     |
| 250            | +     | +    | +     | +     | +     | +     | +     |
| 300            | +     | +    | +     | +     | +     | +     | +     |

It will be seen from this table that if 2½ m. be the limit, the effective powers of 100, 150, 200, 250 and 300 dilutions are same; so also in 5 minutes. In 10 minutes' time the dilutions 150, 200, 250 and 300 show no difference in their effectiveness. When exposure time is half an hour, the contrast between the dilutions 200 and 250 becomes definite—200 showing no growth, while 250 shows growth—and this difference remains constant even if the exposure time be increased from ½ hour to 1 hour or 2 hours. So I concluded that there is no advantage gained by exposure time being shortened to less than half an hour. On the other hand, if the number of dilutions used be increased, by making a large number of finely graded dilutions, the results which are obtained follow exactly the graded dilutions. This increases confidence in the reliability of the test. For example, when the following dilutions of carbolic acid are allowed to act on the culture for half an hour, and then sufficient broth is added to each tube and next kept overnight, we get the following results:—

| Dilutions of carbolic ..                    | 100 | 110 | 120 | 130 | 140 | 150 | 160 (?) | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 |
|---|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Microscopical examinations after ½ hour ... | 0   | 0   | 0   | 0   | 0   | 0   | 0       | ×   | ×   | ×   | ×   | ×   | ×   | ×   | ×   | ×   |
| Result of culture after 24 hours ...        | -   | -   | -   | -   | -   | -   | -       | -   | +   | +   | +   | +   | +   | +   | +   | +   |

0 = no movement; × = active movement.  
- = no growth; + = growth.

used. In the Rideal-Walker test, the time limits are varied from 2½, 5, 7½, 10, 12½ to 15 minutes. I have found that when short time limit is used, the well marked difference in the killing power between widely varying dilutions tends to become obliterated. The following will illustrate my point.

An experiment is made by the method described above, in which carbolic acid (Calvert's Crystalline No. 1) is used. The different dilutions and the exposure time and the results are noted below:—

+ = growth after 24 hours' incubation.  
- = no growth after 24 hours' incubation.

Disinfectant used: carbolic acid:—

The same result was obtained, without any variation, when I repeated the experiments on different occasions at least a dozen times.

As regards the age of the culture, I found no variation resulted from using 1 day's, 2 days' or 4 days' culture.

#### CONCLUSION.

The test as described above gave well-defined and constant results, and so can be used in estimating the disinfectant power of chemicals, in place of the Rideal-Walker test, which is dependent on the use of Witte's peptone—which, being a German product, is out of stock. I will be glad to send to any one wishing to make the test, a strain of the culture of the protozoa, which can be easily kept growing.

## X-RAY WORK IN AN INDIAN GENERAL HOSPITAL IN MESOPOTAMIA.

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DURING the advance to Baghdad and further up, I had the opportunity of examining by X-ray a considerable number of wounded in the Indian General Hospital to which I was attached. Our hospital was located about half-way down the lines of communication. A kutchahut was altered to suit the requirements of the apparatus.

Some difficulty in screening was soon overcome by absolutely excluding light from the room, by tarring the walls and doors and covering the doors with two or three layers of blanket.

The apparatus at my disposal consisted of—

1. Two-stroke Austin engine and dynamo complete with charging-board.
2. Control and switch-board with plug connections.
3. 12-inch spark induction coil.
4. Mercury interrupter, Butt's patent.
5. Butt's X-ray couch with tube box, adjustable screen-holder and mirror.
6. X-ray tubes.
7. Valve tubes, single.
8. Modified MacKenzie Davidson's cross-thread localizer.
9. Fluoroscope, stereoscope, fluorescent screens, intensifying screens, and other necessities.

All the apparatus was Butt's apparatus, and was run for a few months by the current generated in the Austin engine; since by the main, 220-volt, current.

*Two-stroke Austin engine and dynamo complete with charging-board.*—This is a  $1\frac{1}{2}$ -b. h. p. portable power plant, self-contained compact, fitted with dynamo, which has an output of 10 amperes and 70 volts, and a charging-board.

Some difficulty was first experienced in starting the engine, and that was soon overcome by adjusting the carburettor, and repairing the key of crankshaft, which was damaged in transit.

The engine worked well for about two months, and then the r. p. m. fell from 1,300 to 600-800 per minute on account of increase of pressure caused by the blocking of the valves with smoke. This difficulty was overcome by getting the engine thoroughly overhauled by an expert mechanic.

The *Silencer* gave constant trouble and would go red hot very soon. Otherwise the plant gave entire satisfaction.

No trouble whatever was experienced with control and induction coil. Insulation in the induction coil stood the heat experienced here last summer very well: the temperature being  $120^{\circ}$ - $127^{\circ}$  in the shade.

*Butt's Mercury Interrupter.*—Some difficulties were experienced with the interrupter, but they were soon overcome with cleaning and changing the mercury every now and then, as the mercury soon becomes modified by use, with the result that the starting efficiency could not be maintained and the interruptions becoming slow and unequal, producing flickering in the tube and absence of efficiency.

The other precautions which were found useful by experience are—

1. Free and abundant use of dielectric.
2. Thorough search of interrupter for leakage of gas.
3. Reweighing of mercury before filling the interrupter after cleaning, as the quantity of mercury is always reduced a little by use.

Hydrogen was used as dielectric. The gas was generated in Klipp's hydrogen-generator by chemical action of 10 per cent. dilute sulphuric acid on granulated zinc.

*Butt's X-ray couch* was very satisfactory and gave no trouble. The tube box was too small and would not fit and protect a water-cooled or heavy anode tube. The tube box travelled on metal runners and worked very satisfactorily. The tube box was also fitted with iris diaphragm and cross-wires, which were found very useful in localisation. A scale is also fitted at the base on which the tube box rests, with a little pointer. The box may be moved to any position, and a glance at the scale will indicate a certain number.

*Tubes.*—The tubes chiefly used were Reliance, heavy anode, and water-cooled. These tubes were most satisfactory and gave good results, especially the heavy anode tube, even under heavy strain (50 to 60 and more cases were examined at one period).

Only a few good tubes were available, and to cope with such heavy work it was found necessary to divide the patients into hand, forearm, foot, elbow, arm, leg, knee, thigh, and shoulder, first; and other patients for the examination of thick parts afterwards. Thus the same medium tube was made sufficiently hard after being used for some cases of the hand, forearm, foot, elbow, leg, etc., to penetrate through the thick parts, viz., hip, abdomen, chest, etc., and gave very good results, which would not have been the case without a hard (deep penetration) tube for the thick parts. In short, the work done during the period was extremely satisfactory, having in view the limitation of the apparatus for field service.

*Valve tubes.*—They only gave moderate satisfaction, and that too only for a short period. In fact, they gave more trouble than any other part of the apparatus, and afterwards one had



to improvise a series of spark gaps in one of the ligature glass tubes, which is giving great satisfaction.

*Intensifying screens.*—These were used in a very few cases, and with good results, especially where the parts were very thick or the individual exceptionally stout.

*X-ray plates.*—Ilford X-ray plates were used and were found very satisfactory.

*Printing.*—Ilford P.O.P. printing paper only was available, and gave good results.

The following developing, fixing, and combined fixing and toning solutions were used with most satisfactory results:—

#### DEVELOPING SOLUTION.

|  |     |     |            |
|--|-----|-----|------------|
| Metol                                  | ... | ... | 20 grains. |
| Hydroquinone                           | ... | ... | 70 "       |
| Sodium sulphite (cryst.)               | ... | ... | 2 ounces.  |
| Sodium carbonas ( " )                  | ... | ... | 2 "        |
| Potassium bromide 10% sol.             | ... | ... | 80 minims. |
| Distilled water or unchlorinated water | ... | ... | 20 ounces. |

Dissolve the metol first in 8 ounces of pure water. When thoroughly dissolved, the hydroquinone is added. The sodas and bromide are separately dissolved in a further 8 ounces of water. The two solutions are mixed and made up to 20 ounces.

#### FIXING SOLUTION.

|                           |     |     |           |
|---------------------------|-----|-----|-----------|
| Sodium hyposulphite       | ... | ... | 1 lb.     |
| Potassium metabisulphite  | ... | ... | 2 ounces. |
| Unchlorinated clean water | ... | ... | 40 "      |

#### COMBINED TONING AND FIXING SOLUTION.

|                           |     |     |            |
|---------------------------|-----|-----|------------|
| Sodium hyposulphite       | ... | ... | 2 ounces.  |
| Common salt               | ... | ... | 20 grains. |
| Plumbi acetat             | ... | ... | 20 "       |
| Unchlorinated clean water | ... | ... | 20 ounces. |

In a considerable number of cases, foreign bodies were detected and localised. The foreign bodies consisted of rifle bullets, shrapnel bullets, pieces of bombs, and fragments of shells of various sizes and shapes.

The following methods of localisation were adopted and found very useful and accurate:—

1. *A Simple method.*—A foreign body in the limbs can be localised by screening or by plate-taking.

(a) Adjust and focus the tube in the tube box in such a way that the central rays from the target are utilized.

(b) Centre the foreign body in the field of view and mark the location of the foreign body on the skin with aniline ink or solution of nitrate of silver in both antero-posterior and lateral positions of the limb.

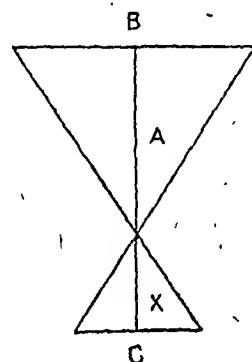
In the antero-posterior position, the distance from a given point or a bony landmark is taken and in the lateral position the depth from the surface. In most cases this was found sufficient.

If there is any doubt, the surgeon himself brings the patient to the X-ray room for rescreening before the operation to make a mental note of the position of the foreign body.

*2nd method.*—This method was found more accurate and useful in foreign bodies lying deeply embedded, and where exact localisation was necessary to remove it.

Focus and adjust the tube in the tube box. Centre the foreign body in the field of vision (contract the diaphragm opening so as to make it easy to centre) and mark on the skin.

A. The distance from the sensitive plate to the target of the anticathode is recorded. Move the tube to a known distance, say 3 cm., and an exposure is made. Then push the tube 3 cm. on the other side of the centre and a second exposure is made on the same plate of equal length.



B. The distance between the two positions of the tube is also recorded.

C. The distance between the two shadows (same points) of the foreign body on the photographic plate.

Then X (that is the depth of the foreign body from the place marked on the skin)

is equal to  $\frac{A \times C}{B + C}$

The above figure illustrates the method of localisation on the modified portable MacKenzie Davidson localiser.

B = Distance between the two positions of the tube.

A = Distance between the target of the anticathode of the tube and sensitive plate placed on the body of the patient radiographed.

C = Distance between the two shadows of the foreign body on the plate.

The red and blue lines = Two threads (black and white). The place where these two threads cross each other on the line A will mark the depth of the foreign body from the skin.

*3rd method.*—Place the patient on the couch and arrange the tube in the tube box with a

focus point at a determined distance beneath the surface of the screen.

Contract the diaphragm opening so as to make it easy to centre the foreign body in the field of view. Mark the point of foreign body on the skin. For the estimation of the depth a mark is placed on the glass of the screen over a selected point of the foreign body. Move the tube and with it the focus to a known distance, say 10 cm. Mark on the glass of the screen the new situation of the selected point of the foreign body. Open the diaphragm if necessary. Measure the distance the shadow of the foreign body has travelled and record it.

Thus *A*, the distance between the target of the anticathode, *B*, the distance between the two positions of the tube, and *C*, the distance the shadow of the foreign body has travelled, are known. The depth of the foreign body from the mark on the skin can be easily calculated either by the above-mentioned formula or on the cross-thread MacKenzie Davidson's apparatus. Or a table for ready reference can be drawn.

Suppose *A* is 50 cm. and *B* is 10 cm., then—

|   |                    |
|---|--------------------|
| $\frac{1}{2}$ cm. traverse on the screen means a depth of | $2\frac{1}{2}$ cm. |
| 1 " " " "   | $4\frac{1}{2}$ "   |
| 2 " " " "   | $8\frac{1}{2}$ "   |
| 3 " " " "   | $11\frac{1}{2}$ "  |
| 4 " " " "   | $14\frac{1}{2}$ "  |

This method was found useful when one had to examine many cases in a short time.

Major Walter, I.M.S., X-ray expert, Dehra, inspected the apparatus at the installation and gave his approval of the working of it. I am very much indebted to Major Walter, I.M.S., for his practical notes on his inspection, and also to Captain Norman, R.A.M.C., X-ray expert, Mesopotamia Expeditionary Force, who, besides giving me a copy of his book on X-ray, has been most helpful on his periodical inspections. My thanks are also due to Private A. H. R. Young, R.A.M.C., X-ray attendant, for his valuable assistance.

The following statistics show in detail the cases examined:

*Foreign bodies.*—Foreign bodies without the fracture of bones were detected and localised in the following parts:—

|                  |     |     |    |
|------------------|-----|-----|----|
| Head             | ... | ... | 10 |
| Neck             | ... | ... | 3  |
| Shoulder         | ... | ... | 12 |
| Arm              | ... | ... | 12 |
| Hand and forearm | ... | ... | 27 |
| Chest            | ... | ... | 15 |
| Abdomen          | ... | ... | 8  |
| Back             | ... | ... | 7  |
| Pelvis           | ... | ... | 8  |
| Thigh            | ... | ... | 27 |
| Leg              | ... | ... | 11 |
| Foot             | ... | ... | 9  |

TOTAL ... 149

Foreign bodies with fracture of bones were detected and localised in the following parts:—

|                                      |     |    |
|--------------------------------------|-----|----|
| Hand and forearm...                  | ... | 16 |
| Arm with fracture of humerus         | ... | 8  |
| Chest with fracture of ribs          | ... | 2  |
| Pelvis with fracture of ilium        | ... | 1  |
| Thigh with fracture of femur         | ... | 3  |
| Leg with fracture of tibia or fibula | ... | 6  |
| Foot                                 | ... | 6  |
| Trunk with fracture of vertebrae     | ... | 2  |
| Head with fracture of skull          | ... | 2  |

TOTAL ... 46

Fractures without foreign bodies were detected as follows:—

|                  |     |     |     |
|------------------|-----|-----|-----|
| Skull            | ... | ... | 4   |
| Hand and forearm | ... | ... | 162 |
| Humerus          | ... | ... | 29  |
| Ribs             | ... | ... | 2   |
| Clavicle         | ... | ... | 6   |
| Scapula          | ... | ... | 2   |
| Femur            | ... | ... | 9   |
| Tibia and fibula | ... | ... | 21  |
| Foot             | ... | ... | 37  |

TOTAL ... 272

## A Mirror of Hospital Practice.

### BLACK-WATER FEVER IN THE AGENCY OF GANJAM DISTRICT.

By Y. S. ROW,

Sub-assistant Surgeon.

TEXT-BOOKS do not refer to this fever as occurring frequently in India, but this disease seems to be fairly common in this Agency. Recently, in the last winter, I came across four cases of black-water fever, all of which present nearly the same characteristics. The place in which these cases occurred is Balliguda, which is about 1,800 feet above sea-level, in the district of Ganjam, which is a permanent haunt of malaria.

There is a common belief in these parts among laymen that black-water fever is due to prolonged taking of quinine as a preventative of malaria; but in these four cases this is quite the contrary.

This black-water fever here seems to attack people who are not permanent residents of this place, and it is practically absent in the inhabitants of this place. This disease seems to occur in people who are residing here for more than a year. Another peculiarity here is that this disease attacks people who are frequent victims of malaria and who do not take quinine regularly; whereas this disease is mostly absent in people who take quinine periodically for the prevention of malaria though they are not inhabitants of this place. Therefore it seems to me that to prevent

black-water fever is only to prevent malaria in this Agency tract.

The fact that this disease is absent in the natives of this place shows that there is a certain amount of immunity in them, just as they have a certain amount of immunity for malarial fever though many have got enlarged spleens.

From the four cases which came to my notice, a brief description of which is given at the end, it may be concluded that black-water fever occurs in this Agency,—

- (1) In people who are not permanent residents of this place.
- (2) In people of the plains who live here more than a year.
- (3) In those people of the plains who do not take quinine regularly as a preventative of malaria. (very common here) and consequently become frequent victims of malaria.
- (4) It does not occur in people of the plains though residing here for more than a year, yet taking quinine periodically for the prevention of malaria.

The cases which I describe below, though the number is too small to draw any definite general conclusions, show the same characteristics stated above.

As regards the treatment followed, all the three cases, except one, recovered by the administration of extract cassia beareana liq. as soon as hæmoglobinuria is observed.

**CASE (1).—**Boy, aged 17, Hindu. When first seen, had a high temperature of 104°F. Urine dark-coloured, quantity small, severe jaundice, feeble pulse; later on suppression of urine, black stools, eventually ending in death.

Former residence.—Russulkonda (not Agency).

*Previous history.*—A patient of frequent malaria. Had black-water fever 10 months previous to the present attack. Never took quinine regularly.

**CASE (2).—**J., female, aged 40, Hindu. When first seen, had a temperature of 104°F. with severe rigors. Temperature rose to 105°F. Urine at first slightly red, giving place eventually to dark-red and lastly black. There were severe jaundice and very bad vomiting. Quantity of urine small, but no suppression. The temperature remittent always except in the end.

Termination.—Recovery in 6 days.

Former residence.—Berhampore (not Agency), came here only 19 months back.

*Previous history.*—A patient of frequent malaria. Never took quinine regularly either for the prevention or for the treatment of malaria.

**CASE (3).—**V., female, aged about 35 years, Hindu. Started with a high fever of about 104°F. with severe rigors. Urine quantity small, colour red changing quickly into black. Motions as black as ink. No jaundice. The temperature was remittent till the end. No suppression of urine.

Termination.—Recovery in 7 days.

Former residence.—Berhampore (not Agency), came into the locality about 11 months back.

*Previous history.*—Had frequent attacks of malaria, never took quinine regularly.

**CASE (4).—**G. N., male, aged about 30 years, Hindu.

The first symptom noticed was passing of red-coloured urine. An hour later temperature rose up to 104.4°F. with severe rigors. In a few hours urine became very dark—as ink. Except the dark-coloured urine and the high fever with its febrile symptoms, nothing peculiar was present.

Termination.—Recovery in 36 hours.

Former residence.—Plains, where this disease is absent; came to this locality about 20 months back.

*Former history.*—A patient of constant malaria; never took quinine regularly.

Out of these three cases which recovered, two were removed from this locality, and another, the last, is still here; but he is now taking quinine as a preventative for malaria periodically.

Another peculiarity of this black-water fever here is that all these four cases appeared within a space of two months in the last winter. Since the last case, which was in the 1st week of January, 1917, no other case has occurred here till now.

## SERVICE NOTES.

THE following notification issued by the Government of India, Army Department, is republished for general information :—

Lieutenant-Colonel H. S. Wood, I.M.S., whose services have been placed at the disposal of the Assam Administration, is appointed to be Civil Surgeon of the Sibsagar district.

THE undermentioned passed students of the Medical College, Calcutta, are appointed to be temporary Civil Assistant Surgeons in Assam, with effect from the dates noted against their names :—

Babu Rajani Mohan Das, M.B., 8th August, 1918;  
Babu Sudhansu Mohan Gupta, M.B., 11th August, 1918;  
Babu Gostha Bohari Bhaduri, M.B., 21st August, 1918.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified :—

Jiwanlal Kapoor, 9th August, 1918; Dwarka Doish, 12th August, 1918; Profulla Ranjan Das Gupta, 21st August, 1918.

THE services of Lieutenant-Colonel J. K. Close, I.M.S., Civil Surgeon, Allahabad, are placed at the disposal of the Government of India, Army Department, with effect from the date he relinquished charge of his duties.

Lieutenant-Colonel Close is 53 years of age and entered the service 1st October, 1887.

THE services of Major W. E. McKechnie, I.M.S., Civil Surgeon, Lucknow, are replaced at the disposal of the Government of India, Army Department, with effect from the date he relinquished charge of his duties.

THE following promotion is made :—

Senior Assistant Surgeon and Honorary Lieutenant Charles Reginald Washington Bancroft, seconded, to be Senior Assistant Surgeon with the honorary rank of Captain, subject to His Majesty's approval, and to remain seconded.

THE services of Lieutenant-Colonel W. H. Kenrick, I.R.C.P., M.R.C.S., D.T.M., I.M.S., Civil Surgeon, Jubbulpore, are placed temporarily at the disposal of the Government of India, Army Department, with effect from the date on which he is relieved of his duties.

# Indian Medical Gazette.

NOVEMBER.

## THE ANTI-HOOKWORM CAMPAIGN.

THE letter recently addressed to the Chairman of the Sanitary Board, Bengal, and published in the press, by H. E. Lord Ronaldshay, the Governor, will serve a double purpose, not only in directing the attention of the sanitary authorities to the ascertained facts of the prevalence of the infection, but what, in the first instance, is even more important, it will make the people themselves realise that there exists among them (to the extent of 75 per cent.) an insidious and persistent infection which results in apathy, lethargy, and disinclination to work, as well as in the more easily recognised symptoms of weakness and anæmia. At first sight there will be scepticism as to the existence of a serious malady so little known and recognised by the laity, but the facts are incontrovertible and the recent researches, referred to by His Excellency, though they go no farther than emphasising facts as to prevalence which, in Bengal and Assam, have been known for a quarter of a century, show that this work must be taken up in India, as it has been in other civilised tropical countries.

It is, of course, not maintained that of the 75 per cent. of people infected this large number are, in ordinary parlance, 'ill.' 'Hookworm wrecks' are probably as rare as 'opium wrecks,' but such are the advanced cases whose pearly white conjunctivæ, tumid belly and oedematous appearance are well known in all hospitals and dispensaries. Milder yet harmful degrees of infection are however extremely common. In the rural areas in Bengal, Assam, Bihar, Central Provinces, Madras and doubtless in other parts of India, three persons out of every four are more or less infected, and more or less suffer from the effects of harbouring the worm.

It has been for long assumed that the milder degrees of infestation are practically harmless, and, no doubt, many men doing hard daily work are mildly infested, but recent researches, both in India and by the workers under the Rockefeller Foundation, have established the fact that the mildest cases should not be neglected, and the best work cannot be done by persons so infected.

His Excellency Lord Ronaldshay has therefore done signal service in reviving the public interest in this campaign.

The disease, or 'infection,' is, we all know, easily curable, the only difficulty is to prevent infection and reinfection. The problem of prevention is summed up in one word,—*latrines*. The public discussion of this subject will have the great advantage of making employers of labour realise this great fact, and will also make them understand that any present expenditure on latrines will amply repay itself, and rapidly, too, in increased efficiency and in increased output of work.

Attempts should also be made in selected rural areas. Here we are up against very ancient and primitive custom, and progress may not be so rapid, but it is not too much to say that the vast majority of the rural inhabitants commit the sanitary sin through sheer ignorance. Much good will surely be done by diffusing information, therefore, on the habits of this intestinal worm and on the method of its spread from man to man.

## Current Topics.

### THE ASSAM PASTEUR INSTITUTE.

THE first annual report of the King Edward VII Memorial Pasteur Institute at Shillong for the year 1917 has been published. It is written by Captain. R. Knowles, I.M.S., the Director.

The first patient came from Calcutta, on 16th January, 1917, and during the year 54 Europeans and 538 Indians came for treatment; the hydrophobia rate was only 0.88 per cent.

The Tables given in the report show the principal features of the European cases treated, whilst Table 16 illustrates for 1917 at Shillong—as is the rule for all Indian institutes—how very much smaller is the degree of risk run by European as compared with Indian patients in India. Most of the European patients came from Bengal; 20 out of the 50 from Calcutta. Their ages ranged from 4 to 74 years; but the group included a larger proportion of adults than is the case with Indian patients. Thirty of the 50 cases were "licks," where the saliva of the rabid animal did come or may have come into contact with some definite fresh abrasion; as against a lick percentage of only 3 per cent. for Indians. The mean degree of wounding is 0.84 tooth marks, as against 3.6 for Indian cases. In a greater proportion of the European cases the brain of the animal was examined and rabies proved. The biting or licking animal concerned in all European cases was the dog; and, usually, the privately-owned dog. At Shillong, as elsewhere in India, the European population treated is a population at much less risk than is the corresponding Indian one. On the other hand, the Institute funds have been generously supported by the

European patients under treatment; whereas the number of Indian patients who contribute is remarkably small.

"Licks" constituted an insignificant majority. Bites on bare skin are the rule. Nineteen per cent. of the Indian cases were bitten by rabid jackals. Sixty-three per cent. of the Indian cases fall into the "C" class in table 15, *viz.*, persons bitten by animals probably rabid, but where the animal's brain has not been examined and no medical or veterinary information as to rabies is forthcoming; and into "sub-class 2," *viz.*, bitten on bare skin elsewhere than on the face, head or neck. All five cases of hydrophobia that occurred were amongst patients in the "C" class, showing the number of animals which are certainly rabid, but where rabies cannot be proved for want of evidence. The difficulty in these "C" cases, of deciding whether the biting animal was or was not rabid, constitutes one of the greatest difficulties in the statistical study of rabies in India. As a rule, where an animal attacks several persons or animals nearly simultaneously without provocation, the inference of rabies may be drawn. But where only one person is severely bitten, such an inference cannot always be drawn; a recent advice case at Shillong was that of a young child who, when playing with a dog of uncertain temper, was bitten very severely, showing 12 deep and lacerated teeth-marks on the face and through both lips, requiring anaesthesia for efficient cauterisation. Such a case, at first sight, would almost certainly be ascribed to a rabid animal: yet the dog remains well weeks after biting.

Thus as regards the rabid jackal, 1917 at Shillong shows—

(1) that the rabid jackal is less concerned than is the rabid dog in swelling the numbers attending an anti-rabic institute for treatment;

(2) that, however, it is very much concerned in the human hydrophobia rate;

(3) that it tends to bite more persons than does the rabid dog, despite the fact that its facilities for biting human beings are less;

(4) that it tends to inflict more wounds and deeper wounds than does the rabid dog: 4.33 wounds for the jackal, as against 3.02 for the dog;

(5) that the proportion of cases bitten on the head is higher when the biting animal is the jackal than when the dog is concerned. Nine out of 97 patients bitten by jackals were bitten on the head; 32 out of 462 patients bitten by dogs were bitten on the head; a percentage of 9.3 per cent., compared with one of 6.9 per cent.

#### *Problems for Solution.*

(1) The isolation and cultivation upon artificial media of the micro-organism of rabies.—The discovery of the real cause of rabies may lead to more accurate knowledge of the disease, of how to prevent and treat it. Noguchi's work on this matter at present lacks both confirmation and practical application.

(2) A most careful study of the failures of treatment of the Pasteurian method.—In the reports of the Kasauli and Coonoor Institutes, since 1901, there are details of a considerable number of these cases. The percentage of such failures is insignificant, *e.g.*, 4 out of the 569 patients treated at Shillong in 1917 were failures of treatment. Yet, in the aggregate, the statistics of these cases are worthy of study. An attempt at such an analysis was commenced early in 1917, but later on was temporarily abandoned. Even if it led to nothing definite, such an enquiry might be worth conducting.

(3) The working out of the best methods of treatment of a declared case of hydrophobia.—The suggested use

of atropine, put forward by Major Norman White and the Kasauli authorities, is helpful. A certain amount of purely preliminary work on this question was carried out at Shillong in 1917. The problem presents itself as one in bio-chemistry. The re-agents which are known to destroy the rabies virus *in vitro* may be summarised as follows:—

(a) A one per cent. solution of carbolic acid at body temperature as used in the preparation of the carbolised anti-rabic vaccine.

(b) One-half per cent. solution of salicylaldehyde, benzaldehyde, or furfural and the aldehydes generally.

(c) A 0.08 per cent. solution of formaldehyde vapour.

(d) A 1 in 1,000 solution of perchloride of mercury (Rosenau).

The experiments carried out in 1917 are not worth detailed record; but the following experimentally ascertained facts may be of use to other workers in the same field. The animals used throughout were fixed virus rabbits.

(a) Sub-dural injection of any amount of any fluid exceeding 0.6 c.c. in the rabbit is liable to prove immediately fatal, from cerebral compression, at least where the experiment is conducted under ether anaesthesia. An occasional rabbit, however, will stand up to 1½ c.c. of 1 per cent. carbolised saline without symptoms.

(b) Intravenous administration of carbolic acid, formalin, and furfural in no way checked the development of the disease, whether administered before, during, or after its onset.

(c) On sub-dural injection of these drugs, it was found that formalin was excessively toxic, 1 per cent. carbolised saline a little less so; but that 0.5 c.c. of a 2 per cent. solution of furfural in saline was practically non-toxic.

(4) The ascertaining which is the best cauterising agent for the bite is worth experimental investigation, but will need prolonged and exact experiment. The above re-agents are obviously those most worthy of attention.

Colonel G. W. P. Dennis, C.I.E., I.M.S. (retd.), kindly undertook the management of the rabbit-breeding operations and with great success.

In addition to the rabic work the Institute did a considerable amount of research work of great value on cholera, typhoid, kala-azar and malaria. The following notes give the results of the experience gained in the tartar emetic treatment of kala-azar:—

(1) A 1 per cent. solution (in normal saline) is preferable to a 2 per cent. In the course of the 301 intravenous injections of tartar emetic given at Shillong to these cases, sepsis, abscess, or ulceration has never once been seen. For an adult a course of 18 to 20 injections of the 1 per cent., commencing at 4 c.c. and rising to 12 c.c., but not further, is recommended.

(2) A two-day interval between injections is advisable. Towards the end of treatment the dose should not be pushed, and the intervals should be lengthened, owing to the tendency of the drug to cumulation in the liver and other tissues. A two-gramme course, distributed over three months, seems to be a sufficient treatment to definitely sterilise an adult from parasites.

(3) The urine should be examined at intervals for albumin. Albuminuria is not a contra-indication to intravenous tartar emetic; but it is a signal to go slowly.

(4) The state of the heart should also be studied during treatment. The sudden appearance of oedema during treatment may be a danger signal pointing to cumulation of the drug.



(5) Tartar emetic is neither a hæmatinic nor a tonic drug. The full treatment of a case includes dieting, appropriate treatment for any helminthic infections; and other measures.

(6) For these reasons, the treatment is at its best when given to in-patients in hospital, though it is probable that it will also have to be largely used in out-patient practice.

(7) Successful treatment of actual cases may possibly prove a shorter cut to the eradication or limitation of kala-azar in Assam than attempts at household removals over many years on a large scale.

During the summer the Institute had the honour of numbering Sir Leonard Rogers as one of the temporary workers in the laboratories; and he very kindly showed the writer his technique and method of giving quinine intravenously in concentrated solution to malarial cases. The method was adopted at the Institute as a routine procedure for all malarial cases, either amongst anti-rabic or other patients, from 12th June, 1917, onwards. During the next six months, 139 injections of a 5 per cent. solution of acid hydrobromide in saline were given to 28 patients. In one instance, a very severe attack of malignant tertian, when the patient could not tolerate quinine in any form by the mouth, the injections saved life. The conclusions come to as regards this method of treatment were as follows:—

(1) The intravenous administration of quinine in concentrated solution is the quickest and surest method of immediately cutting short a febrile attack of malaria; it is much preferable to intra-muscular injections, and unattended by the unpleasant sequelæ, which so often follow the latter.

(2) It cannot, however, be relied upon to exterminate the malarial parasites from the patient's system; and it should be supplemented either at the time of the attack or later by an oral course of quinine.

(3) The special rôle of the method is in the treatment of fulminant cases. The writer, however, prefers its use as a routine measure during the febrile attack in all cases of malarial fever. Even when the patient cannot tolerate quinine by the mouth, the fever can be at once terminated by intravenous quinine; whilst other drugs are given to combat gastric and hepatic irritation.

(4) The most suitable solution is probably a 5 to 10 per cent. solution of the acid hydrobromide in normal saline; but further work on other salts is desirable.

(5) For an adult, five consecutive daily injections of from 7 to 10 c.c. of the 5 per cent. solution are recommended. In a critical case a gramme may be at once given intravenously. The injections should, as far as possible, be so timed as to coincide with the rising temperature.

(6) The 28 cases treated at Shillong included 5 females, and the ages of the patients ranged from 10 to 55 years. The method has been used in advanced pregnancy and also in a case of very severe dysmenorrhœa without causing any distress to the patients.

Research work on the causation of malarial relapses has been commenced during the later part of the year, the method adopted being the injection of massive doses of malignant tertian crescents intravenously into animals. It is hoped to continue this work during 1918; but the evolution of some method of concentrating living hæmatozoa in enormous numbers in a form suitable for intravenous injections forms a necessary preliminary to any further investigation.

The report also alludes to the help given by the late Dr. W. C. Hossack in certain investigations into diphtheria in connection with an outbreak at Shillong.

The Director is to be congratulated on the excellent work done by the Institute in its first year of existence.

#### THE PASTEUR INSTITUTE, COONOR.

THE 11th report of this Institute up to 28th February, 1918, has just been received, from which we make the following extracts:—

No less than 2,396 patients attended for treatment, a marked increase on the figures of previous years. The virus was in its 611th passage on 28th, February.

It is clear that additional provision will have to be made for the increasing number of patients, and this involves increased accommodation and also an increase in the staff.

"The enquiry under G. O. No. 716, Public, dated 3rd July, 1911, was continued during the year. The following table shows the results so far obtained:—

| YEAR.       | Persons observed. | Number treated. | Deaths among treated from hydrophobia. | Percentage of deaths. | Number untreated. | Deaths among untreated from hydrophobia. | Percentage of deaths. |
|-------------|-------------------|-----------------|--|-----------------------|-------------------|--|-----------------------|
| 1913-14 ... | 444               | 169             | 5                                      | 2.95                  | 275               | 20                                       | 7.27                  |
| 1914-15 ... | 382               | 123             | 3                                      | 2.43                  | 259               | 16                                       | 6.17                  |
| 1915-16 ... | 203               | 83              | ...                                    | ...                   | 120               | 3  | 2.50                  |
| 1916-17 ... | 242               | 85              | 3                                      | 3.53                  | 157               | 6  | 3.82                  |
| 1917-18 ... | 207               | 86              | 7                                      | 8.13                  | 121               | 7  | 5.78                  |
| TOTAL ...   | 1,478             | 546             | 18                                     | 3.29                  | 932               | 52                                       | 5.57                  |

When one or more patients who have been bitten by the same animal arrive for treatment shortly afterwards, and state that others who have been bitten by that animal do not intend to come for treatment, the names and addresses of all the bitten persons are obtained, so far as possible, and sent to the local medical officer, who arranges for their observation for a period of three months. It is hoped in this way eventually to get sufficient information to show the influence of treatment."

The following facts cannot be too well known:—

"Instructions for dealing with persons bitten by dogs or other animals which may be rabid.

1. When any person is bitten by an unknown dog without provocation, he should go to Coonoor for treatment without delay, for experience has shown that it is likely that such a dog is rabid.

2. When any person is bitten by a dog which is known and can be captured, that dog should not be killed but securely tied up.

(a) If it is alive and well ten days after inflicting the bite, the person bitten need not go for treatment.

(b) If, however, the dog falls ill or dies within ten days, the person bitten should go for treatment and take with him portions of the dog's brain for verification, preserved according to the instructions issued.

3. Persons who are licked on the unbroken skin need not come for treatment.

4. Persons who have merely handled rabid animals and have no recent wounds need not come for treatment."

#### TREATMENT OF BITES BY RABID ANIMALS.

THE following useful and practical note has been circulated by the Surgeon-General, Madras, and is worth a wider circulation :—

It is probable that the risk run by persons who are bitten by rabid animals can be reduced considerably by efficient treatment of the bite wounds as soon as possible after their infliction. It has always been held that cauterisation of wounds is a wise precaution and that the risk of infection is reduced by early and by thorough cauterisation, and it has been proved scientifically that cauterisation produces a slight increase in the length of the incubation period of the disease and reduces the risk of hydrophobia for the persons bitten. *Thorough and effective application of a caustic is, however, most necessary.* In many of the cases which are brought to my notice, cauterisation has not been thoroughly performed or has been performed too late. Cauterisation should therefore be performed in every instance of the bite of an animal, even though the animal be only suspected of rabies. Cauterisation should be done at the earliest possible moment. Superficial scratches and abrasions are easy to cauterise thoroughly and effectively, but lacerations and deep punctures are difficult to cauterise thoroughly, although it is these latter wounds which demand treatment most urgently. There is a tendency amongst medical practitioners to cauterise such wounds to too small an extent and, in fact in some cases, to make a mere pretence of cauterisation. The object of cauterisation is to destroy any virus that might have been introduced into the wound and might still be there, and the only way to do this is to destroy the whole surface of the tissues that have been reached by the teeth or the claws of the rabid animal. The virus of rabies cannot enter through unbroken skin.

Wounds may be classified thus :—

- (1) superficial scratches and abrasions,
- (2) simple punctures,
- (3) lacerated wounds with pockets.

(1) is easily dealt with, it is (2) and (3) which are difficult for the practitioner and so full of risk for the patient. Cauterising agents are those which destroy the tissues and with them the virus they contain. They all act by coagulating the protein they come in contact with, causing its death or necrosis, and some may even go further and carbonise or even completely oxidise and burn away tissues. Heat as applied by a hot iron will carbonise and eventually burn away the tissues; strong sulphuric acid will carbonise them; strong nitric and hydrochloric acids will cause necrosis of any tissue they come into contact with; glacial acetic acid coagulates protein and causes its necrosis, so also formalin and a host of other liquids.

Any of these agents will do what is required, but all must be used with care and their action limited strictly to the tissues it is considered necessary to destroy.

None of them, however, can reach and destroy virus which has already got beyond the limits of the wound. How often and when that happens is not known, so the safest plan is to cauterise as soon as possible.

A superficial wound which has no pockets can be easily sterilised by nitric acid, hydrochloric acid, glacial acetic acid, undiluted formalin, or by a hot iron.

It may then be dressed and the slough allowed to separate naturally, or the necrosed surface can be excised.

*Silver nitrate should not be employed either in solution or in stick.*

A punctured wound may end in subcutaneous fat, muscle, or may enter a tendon sheath or joint. A destructive acid which enters a tendon sheath may cause a great deal of subsequent trouble, but, bearing this possibility in mind, probably the best practice is to introduce the caustic fluid to the bottom of the puncture with a glass pipette or pointed glass rod. The pipette is best, one used for filling fountain pens will serve. The acid must not be allowed to run all over the surrounding skin and the patient must be placed so that this cannot happen. It is a safeguard to grease the skin all round the wound before commencing the operation. The excess acid can be sucked out of the puncture after about 30 seconds.

Having destroyed as much of the virus as is possible in this way, it must be remembered that the necrosed tissue will have to separate, that the wound will take a long time to heal and may perhaps suppurate as the Indian patient is not very careful of his dressings.

It would be good surgical practice to excise the whole of the necrosed surfaces a few minutes after the acid application and to sew up the wound and obtain healing by first intention. Excision should not be practised until the virus has first been destroyed *in situ*, for fear of infecting the fresh wound.

In extensively lacerated wounds the same procedure should be followed. The whole of the exposed tissues should be carefully and systematically destroyed by liquid caustic or the actual cautery and then excised and the wounds sewn up. General or local anaesthetics must, of course, be used for these operations.

No definite time can be laid down after which this surgical treatment would fail to be of use, but I would tentatively suggest that it should be done in every case up to 72 hours after the bite, and the sooner the better. The patients should then be sent to Coonoor for the usual course of anti-rabic inoculations. Even if patients will not submit to excision the cauterisation should be thoroughly executed.

One may expect two distinct benefits to arise : (1) lessened mortality from rabies, (2) fewer severe septic infections which require incisions and baths with long continued dressings, after the arrival of the patients at Coonoor. Finally, treatment should be undertaken by the local medical officer, who first sees the patient, whether the latter is willing to proceed subsequently to the Pasteur Institute at Coonoor or not.

#### RHINOSPORIDIUM KINEALYI.

THE following account by Dr. S. Chelliah, of Colombo, shows that this parasite (first discovered by Lieutenant-Colonel F. O'Kinealy, I.M.S., of Calcutta), while certainly rare, is not unknown in Ceylon :—

Rhinosporidium Kinealyi is a protozoan parasite, belonging to the class, Sporozoon. On account of the spore formation commencing at an early period, and proceeding continuously, during the growth of the trophozoite, Minchin and Fantham place it in the subclass, Neosporidia.

Although the first mention of the parasite was made by Lieutenant-Colonel F. O'Kinealy in 1894, and communicated to the Laryngological Society, London, in

1903, yet the honour of a full description of the parasite was reserved for Minchin and Frantam, in December, 1905. They had an opportunity to examine the sections of a nasal polypus, sent to Beattie of Edinburgh in July, 1905, by Nair of Madras, who, in his practice as aural and nasal surgeon, had come across a number of polypi, which arose from the nasal septum and which, on removal, were attended with very troublesome hæmorrhage of patients coming from the native state of Cochin, on the West Coast of India.

Although a large number of patients, with intra-nasal growths, has been, from time to time, admitted into the various surgical wards of the General Hospital, yet only recently, through the kind courtesy of Dr. A. M. De Silva, Surgeon, General Hospital, Aural and Nasal Surgeon, Victoria Memorial Eye Hospital, Colombo, I have had an opportunity to examine, microscopically, sections of these growths, in some of which at least the characteristic spores were identified.

Hence from to-day, we may fairly well say that the parasite has its habitat, not only in Cochin State, India, but also in this small island of ours, Ceylon. Castellani and Chalmers need no more say in their Manual of Tropical Medicine that 'at present, it is only known in India.'

The following are a few cases:—

CASE I.—M. A.—, Moorman, æt 17, admitted with left intra-nasal polypus of about 6 months' duration, complained of no pain, but had difficulty of breathing and a nasal twang on speaking.

CASE II.—J. S.—, Singhalese, æt 19, admitted with a growth in the right naris of a month's duration. No epistaxis, but complained of difficulty of breathing.

CASE III.—K.—, Moorman, æt 58, admitted with an intra-nasal growth of two months' duration, no pain, no epistaxis, but complained of difficulty of breathing.

In all these cases, the growths were removed under chloroform.

The reason for reporting these cases is to show that Cases I and III, though Moormen, have never been to India; and the Case II is a Singhalese, he too has never been out of Ceylon. I have visited their houses and personally made inquiries on this point.

*Microscopical appearances.*—The growths, which are in the bottles, were taken from some of the cases reported above. All present the same characteristic features. They are found to be vascular, fleshy and pedunculated, attached to the anterior and upper part of the cartilaginous septum, varying in size and shape from a pea to a bean, freely movable and painless. They are studded with minute yellowish white dots, which are quite visible to the naked eye and can be dissected out.

*Microscopical features.*—The growth is covered by stratified epithelium, which shows here and there signs of proliferation. The cysts which are oval, round, or irregular bodies, are usually found under the epithelium where there is a stroma formed of delicate fibrous tissue. A fully developed cyst is lined with protoplasm, in which young pansporoblasts are forming while the centre of the parasite is full of old spores, separated from one another by an indefinite framework, continuous with the capsule. The wall of the cyst is usually thin. The spores are set free by the rupture of the cyst wall and may infiltrate the surrounding tissues or escape from the host in the nasal secretion.

I am obliged to Daniels and Alcock for the following description of a young parasite.

"The youngest parasites consist of granular protoplasm, enclosed by a hyaline membrane and containing

numerous nuclei. As the parasite grows, a thick capsule forms, and from the layer of cells in contact with this, numerous other cells are formed and pushed towards the centre. The older cells increase in size and become multinuclear, and the protoplasm segments into numerous uninuclear pansporoblasts, which, in their turn, give rise to numerous spores."

The parasite has also been recorded by Beattie as occurring in aural polypi, also in Indians.

Though nothing is so far known as to the method in which infection is spread, yet I am confident that the time spent in investigating this parasite will not be vain.

#### REFERENCES.

- (1) Minchin and Frantam, Quarterly Journal of Microscopical Science, London, 1905, Vol. XLIX.
- (2) O'Kinealy, Proceedings of Laryngological Society, London, 1903, Vol. X.
- (3) Beattie, Journal of Pathology and Bacteriology, June, 1906.
- (4) Castellani and Chalmers, Manual of Tropical Medicine.
- (5) Daniels and Alcock, Tropical Medicine and Hygiene.

#### PHYSIQUE OF U. S. ARMY RECRUITS.

In *The Military Surgeon* (July, 1918) Major Clarence L. Cole, of the Medical Corps, has an article on the physical examination of 20,000 volunteers. His conclusions are here given:—

1. Practically 50 per cent. of all candidates volunteering for military service—20,000 men examined—have physical defects which incapacitate for military service entirely or reduce efficiency.
2. The present method of examination requires acceptance of many defective men or rejection of many men who can be made capable of performing military service.
3. Establishment of refitting stations with properly organized staff for medical treatment and military drill would afford time for observation of men before discharge or afford an opportunity for treatment of curable defects.
4. The number of men available for military service would be increased.
5. The military efficiency of the forces would be increased through bringing all men to a higher physical standard.
6. More efficient intensive training could be given at training camps through reducing the number of men admitted to camp hospitals for physical defects existing at the time of enlistment.
7. Many physical defects exist in young men of military age which could have been corrected, by proper inspection and physical development, while the individuals were school children, if provision had been made for such procedure in our schools.

#### SANDAL-WOOD OIL IN GONORRHOEA.

THIS is an old remedy for an old complaint, but it is claimed that the best use has not hitherto been made of the drug—so we quote the following account of the French use of the drug, as given in *The Practitioner* (p. 115, August, 1918).

Gougerot draws attention to a book lately published, in which Paul Vidal shows that sandal-wood oil, given in large doses, is a specific in the treatment of gonorrhœa, to just the same extent as there are specifics for the treatment of syphilis and malaria. Up to the present, this drug has nearly always been given in too small

doses or at the wrong stage. For its successful use as a specific in gonorrhoea two conditions must be fulfilled—one of dose, and the other of absorption. Vidal gives a daily dose of from 5 to 6 grammes, net weight. In order that the drug may be tolerated, and that the frequently severe lumbar pain caused may be avoided, he insists that the dose must never be taken during the two hours preceding a meal, during the meals themselves, nor in the hour subsequent to these. The oil must be of guaranteed purity, and in large capsules. Small capsules should never be given, for a large number is then necessary, and the gelatin containers are indigestible. He states that the specific effect is due to the fact that the gonococcus never becomes inured to the drug, whereas all antiseptics, whether used externally or internally, lose their effect in a few days. All forms of gonorrhoea, acute and chronic, and its complications are benefited by large doses of the drug, but in differing degrees. It acts very much more effectually the more recent the infection, before the coccus has had an opportunity of establishing itself in the glands and being surrounded by fibrous tissue.

**Acute Urethritis.**—The treatment is begun on the first day. The drug is given in large capsules containing 1 g. net of the oil, a weight of about 1.60 including the gelatin capsule. The doses are given so that the capsules are absorbed at least two hours before a meal and at least an hour after. The first capsule is taken at 6-30 a.m. in the case of a soldier, with réveille at 5 a.m.; the second at 8 a.m., two hours before breakfast at 10; the third at mid-day; the fourth at 3 p.m., dinner being at 5 p.m.; the fifth at 7 p.m.; and, if possible, a sixth at 9 p.m. These doses are continued daily for from 15 to 20 days. From the 15th to 20th day, or from the 20th to the 25th, the dose is reduced to 4 g.; to 3 g. from the 20th to the 30th; and then to 2 g. from the 30th to the 40th. Local treatment is of useful assistance, but only provided that the surgeon can carry it out himself or by a properly trained assistant. It is not indispensable. The patient can continue to follow his usual course of life. Recovery is often noted as apparently complete by the tenth day, but the treatment must be kept up, for relapses are induced by very slight causes.

**Chronic Urethritis.**—At this stage it is difficult to destroy the causative agent, which has become sheltered by more or less deep induration. Recovery can only be assured by persisting in the treatment, which must be modified in such a way as to allow prolonged ingestion, and by the use of adjuvant methods of treatment.

The first is obtained by giving large doses, 6 and 7 g. for eight days, then resuming after an interval of eight days. The second is promoted by the usual massage of the urethra with the help of a sound, so as to disperse the exudations, empty the glands of their cocci, and improve the condition of the tissues. As a rule, carefully carried out, this is sufficient, but it is sometimes necessary to take further measures—instillation of nitrate of silver or protargol, massage of the prostate, dilatations, cauterisations or galvano-cautery through the urethroscope. In any case the large doses of the drug must be continued, so as to bring it to bear upon the acute effects set up by massage and dilatations.

**Complications.**—In these the effect of the drug is considerable. Orchitis and cystitis yield to its influence in a few days. Vidal declares that the same effect is produced upon arthritis and ophthalmia. In every case the treatment should be instituted at the earliest possible moment.

SANCTION, at last, has been given for the supply of apparatus for saline injections, in cases

of cholera, to the troops, and on the following scale:—

*Scale of issue of Cholera Apparatus to Divisions and Independent Brigades.*

|                                 | NUMBER OF SETS.  |               |                    |
|---------------------------------|------------------|---------------|--------------------|
|                                 | Comple-<br>ment. | On<br>charge. | Now<br>authorised. |
| 1st (Peshawar) Division ...     | 15               | 6             | 9                  |
| 2nd (Rawalpindi) Division ...   | 14               | 3             | 11                 |
| 16th (Indian) Division ...      | 18               | 3             | 15                 |
| 4th (Quetta) Division ...       | 8                | 1             | 7                  |
| 5th (Mhow) Division ...         | 24               | 3             | 21                 |
| Poona Division ...              | 23               | 17            | 6                  |
| Meerut Division ...             | 25               | 19            | 6                  |
| 8th (Lucknow) Division ...      | 22               | 12            | 10                 |
| 9th (Secunderabad) Division ... | 24               | 15            | 9                  |
| Burma Division ...              | 11               | ...           | 11                 |
| Karachi Brigade ...             | 6                | 1             | 5                  |
| Bannu Brigade ...               | 6                | 1             | 5                  |
| Kohat Brigade ...               | 5                | 1             | 4                  |
| Derajat Brigade ...             | 5                | 1             | 4                  |
|                                 | 206              | 83            | 123                |

A TRAINING School for "Women Health and Maternity Supervisors" (as they are quaintly to be called) will be opened in Nicholson Road, Delhi, on 1st November. Application for admission is to be made to Dr. M. I. Balfour, Simla.

## Reviews.

**Clinical Case Taking.**—By R. D. KEITH, M.D.  
London: H. K. Lewis & Co., Ltd., 1918. Pp. 104.  
Crown 8vo. Price 3s. 6d. net.

THIS is a small and handy little book on the important subject of Clinical Case Taking by Dr. Robert D. Keith, formerly Principal of the King Edward Medical School of Singapore.

It is one of the most necessary subjects of a student's career, and clinical case taking cannot be too thoroughly taught, and judging from a long acquaintance with the Indian practitioner it is a subject which is not as thoroughly emphasised as it should be in Indian medical schools. There is a useful chapter on the microscopical examination of fæces, blood sputum, etc. Indeed we can recommend this as a useful companion for the students, and if Indian students were thoroughly grounded in it, there would be many better attempts made at diagnosis.

**Medical Diagnosis.**—By C. L. GREENE, M.D.  
London: W. Heinemann, Ltd. 14 Plates and 548 Illustrations. Price 2 guineas.

THOUGH nominally a fourth edition, this is practically a new book. It is now an up-to-date volume "embracing all that is practical and

proven of value to the student and practitioner in modern diagnostic methods."

The author has had vast experience as a teacher at St. Paul, Minnesota.

The book is a valuable one and can well be recommended to the practitioner. The chapter on fundamental principles is as wise as it is original. The chapter on the significance of pain is excellent and there is much of interest in the section on feigned states. There is, too, a lot to be learned from the chapter on gastric and duodenal ulcers. The heart chapters are good. The book is well printed with a good index; use of different types and marginal headings, all combine to make the book an excellent standby for the practitioner.

**Aids to Medical Diagnosis.**—By ARTHUR WHITING, M.D., F.S.C. London: Baillière, Tindall & Cox, 1918. Fcap. 8vo., pp. 167. Price 3s.

THIS is the second edition of this excellent little aid. In the limits of the space will be found a very great amount of useful information on the diagnosis of cases. The second edition has been improved and practically rewritten, and certainly gives a "bird's-eye view" of the main points in differential diagnosis, the weak point of a majority of Indian students.

We can strongly recommend this book to medical students in India.

**Archives of Ophthalmology: Present State of the Operation for the Extraction of Cataract-in-the-capsule.**—By Dr. ARNOLD KNAPP, New York. (*Archives of Ophthalmology*, Vol. XLVI, 1917.)

STARTING with the truism, particularly applicable when a new method of cataract extraction is on its trial, "the aim of a cataract operation is to obtain the best vision with the least risk to the eye," Dr. Knapp first considers the statistics of the different operations. He states that the visual results after intra-capsular extraction (expression) have not been observed or tabulated in such a manner as to serve as a basis for comparison. Owing to conditions which obtain in India, and which are entirely beyond the operator's control, visual statistics of Smith's cases are difficult to obtain, as suitable examination and observation of the subsequent course of the cases are not possible. Smith himself in 1905 recorded in 2,616 extractions-in-the-capsule, 99.27 per cent. first-class results. Of those who have worked under Smith in India, only a few have published any statistics on operations performed on Europeans after their return. Greene and Millette (1912) in 203 cases obtained  $V=\frac{20}{40}$  or better in 73 per cent. Fisher (1916) in 94 consecutive intra-capsular operations obtained  $V=\frac{20}{40}$  or better in 80 per cent. Knapp himself (1915) in 100 consecutive extractions-in-the-capsule by a modi-

fied method of operation got  $\frac{20}{40}$  or better in 70 per cent. These included 24 complicated cases, in which presumably the operation had better not have been undertaken. Excluding them the percentage rose to 97 per cent. Hermann Knapp in 1,000 consecutive capsulotomy operations obtained  $\frac{20}{40}$  or better in 52 per cent. Duncan's results were 62 per cent. These results strike one as poor. It would be interesting to know in what proportion the vision was  $\frac{5}{10}$  and better, and in what number discission was performed.

Secondly, as regards risk to the eye. The importance of a trained assistant in Smith's operation is recognised. The section is purely corneal and so easier to make, but it heals less quickly and sometimes gives rise to what is called a riding flap, and it is more exposed to infection. Knapp is a very strong advocate of a conjunctival flap. Its drawbacks are that it is harder to make and it may cause bleeding into the anterior chamber. Loss of vitreous he regards as a serious objection to Smith's operation, and though Smith himself has reduced it to 5 per cent. or less, in other less skilful hands it is much greater, 30 to 40 per cent. even having been published. Knapp says that, aside from the danger of infection it entails, loss of vitreous is generally followed by reaction on the part of the vitreous body, particularly if it was necessary to introduce the spoon into the eye. He has observed not only permanent opacity of the vitreous but in many cases an optic neuritis, unquestionably an evidence of a toxic reaction. Even slight prolapse moreover prevents accurate coaptation of the wound edges of the section, thereby delaying healing and inviting secondary infection, and it prevents the proper toilet of the wound, particularly the reposition of the iris columns. Iritis is less frequent after the intra-capsular operation but it does occur, and thickening of hyaloid, indicative of cyclitic involvement is also observed; furthermore, hæmorrhage into the anterior chamber in these cases is extremely slow in absorbing. Prolapse of iris, frequently met with and very troublesome, is not referred to. It is a mistake, he says, to minimise the difficulties of an intra-capsular operation. If all goes smoothly in the hands of a skilful operator there is no more beautiful operation. He might have added that the brilliant results in "smooth" cases are dangerously apt to outweigh the failures, specially with men who do not keep careful notes and work out their results. As Dr. C. F. Clark, one of Smith's pupils who has given up doing it since his return to America, says:—While entirely ready to acknowledge that in a number of instances brilliant results can be obtained by the Smith's method, the number of cases in which dismal failures follow it would be enough to deter him from adopting it as a routine practice.



After his return from India Knapp found he did not succeed in sublaxating cataracts with the amount of pressure he thought compatible with safety, so for that reason and the reasons given above he abandoned Smith's operation. He has since grasped the anterior capsule with Kalt's forceps—in half the cases dislocating the lens entire in this way—in the other half resulting in capsulotomy. He makes a conjunctival flap in all cases.

Finally Knapp says he wrote to nine American ophthalmologists who had visited India and been trained under Smith's direct instruction, asking their opinion of the Smith's operation from the American standpoint and its applicability to European patients and their results. One did not reply. Of the others, including himself, two do not practise it at all, one does it in 50 per cent. of his cases, and the other five perform it in all cases. Knapp gives their replies in some detail, and concludes as follows:—"I do not think that the profession at large will know any more about the risks of the Smith-Indian operation until more reports appear. My own opinion is that the whole question narrows itself down to this: Are we justified for the purpose of obtaining better vision in some additional cases to increase the number of poor results and failures directly referable to the method of operating? I think not. At the same time the extraction of cataract-in-the-capsule is so ideal that our endeavours and the progress in ophthalmic surgery must be along the lines of intra-capsular extraction, devising a method which is easier to perform and less dangerous to the eye than the Smith-Indian operation. Whatever success these efforts will have will be entirely due to the pioneer work of Henry Smith." We may add that this is doing too little justice to Macnamara (I. M. S., 1870), Pagenstecher, Wright (U. S. A., 1881), and Mulroney (I. M. S.), who all performed and advocated expression of cataract-in-the-capsule.

**The Romance of the Human Body.**—By R. C. MACFIE, M.B., LL.D. London: Wells, Gardener, Darton & Co., Ltd. Price 5s.

THIS book is difficult to place, it is not clear to what section of the public it is addressed. The author is a scientific man and has published a volume of poems, and it has been said that in this book he shows how in the hands of a poet science wins warmth and colour.

The medical man will not find much that is new, but his knowledge is presented to him in a new, vivid and imaginative way which makes all the chapters eminently readable and often suggestive. The chapters on heredity, mendelism and the evolutionary position of man are certainly attractive, though very few will follow the author in his belief that the petty portion of

the Universe known as the earth "was created by a prescient Intelligence."

The book will certainly be read with interest.

**The Canal Zone Medical Association.**—July to December, 1916, Vol. IX, pp. 12. Panama Canal Press, 1918.

*The Proceedings* of the Medical Association of the Panama Canal Medical Association are always of interest and have frequently been quoted in these columns. The issue now before us deals with the half-year July-December, 1916, but was not published for 1918.

It contains a large number of useful papers among which we may specially mention those on acidosis in children by Dr. R. C. Connor, on war and mental disease by Dr. T. D. Woodson; the contra-indications for spinal anaesthesia in the field by C. C. Yount, renal anomalies in 2,823 autopsies by Dr. B. C. Clark, few joint lesions in 832 autopsies by the same author.

Perhaps the paper we read with greatest interest is that on *Chronic Intestinal Amebiasis* by Dr. Wm. M. James, whose good work in the Canal Zone is well known. Dr. James some years ago pointed out that "dysentery was only a symptom of one phase" of amoebic intestinal infection, and he gives the following description of chronic intestinal amebiasis:—

There is nothing particularly specific about the history of a case of chronic-intestinal amebiasis. The usual patient gives his history somewhat as follows: He has had vague intestinal disturbances for a long time, gets acid stomach, and sometimes, but by no means always, gives a history of having passed a little blood, or of alternating sequences of constipation and diarrhoea. If there is no history that would point to a possible dysentery, it can be readily seen that the patient's complaints may be due to any one of a good many troubles, especially if he has been exposed to infection with the worms that are so common in this part of the world. I myself have treated such cases for hyperacidity, intestinal indigestion, neurasthenia, anaemia, or whatever other symptom or symptoms might be most prominent, without giving any relief to speak of until the correct diagnosis was established, and I have no doubt that others may have done the same. It is well known to you that disturbances of digestion, due to inability properly to assimilate the carbohydrates, form in Panama and the Canal Zone a very large part of the out-patient service and no inconsiderable proportion of the hospital cases as well. The symptomatology of many cases of chronic intestinal amebiasis is practically the same as in the group just mentioned, as is the daily diet also. Loss of weight and alternating sequences of diarrhoea and constipation belong in no way exclusively to chronic amebiasis, nor is loss of weight associated with this solely, and yet these are about the only two constant symptoms that might be called characteristics of this infection. I am not, of course, speaking of those cases in which a definite history of dysentery can be obtained. Such cases, as you very well know, are always open to suspicion, and no doctor with experience in this part of the world will fail to make prolonged and repeated stool examination when this history has been obtained if he wished to obtain results.

Beyond this, there is very little more that I can tell you about this important and interesting infection. It is a subject, I believe, that hitherto has not been brought to any extent before this society, and my purpose in so doing to-night is more to call your attention to the fact that such an infection without dysenteric symptoms, or with only vague symptoms, of dysentery, is prevalent in this part of the world; far more prevalent, I believe, than we have knowledge of, because only a few individuals who can afford the trip and treatment, come to us for diagnosis. One of my patients, a very intelligent and highly educated Colombian, who takes a great interest in the diseases prevailing in his native place, who came to me for chronic indigestion and whom I found to be infected with *Entamebic histolytica*, who had never had as far as he could remember any dysentery, told me that the trouble for which he came to consult me was very prevalent along the sea coast and river valleys of Colombia.

The treatment of this condition is the same as that of acute amoebic dysentery.

He then goes on to depreciate a sole reliance upon emetin, and remarks as follows:—

I have seen three cases of frank amoebic dysentery in the past three months that had been liberally dosed with this drug and who had experienced decided temporary relief, only to suffer from a severe relapse. I do not mean to disparage the use of emetin, but it is not a specific, and a thorough test of it, when we first obtained it here some years ago, demonstrated to me that it could not be relied upon to effect a permanent cure, although there is no question as to the temporary relief it will give. Intestinal amebiasis, whether acute or chronic, can be eradicated, provided the patient is not in *extremis* with the acute form, with the same certainty as malaria and with more certainty than syphilis, by the use of a liquid diet until the stools are formed, and of bismuth given in doses of not less than a teaspoonful four times a day, continuing over a period of several weeks, and emetin to the point of physiological reaction.

That bismuth and a proper diet alone will cure amoebic infection and cure it permanently, can be proved by the fact that there are in Panama and in the Canal Zone not a few persons who received this treatment seven or eight years ago and who have had no relapse or symptoms since.

In the discussion which followed, Dr. W. T. Burres bore ample testimony to the value of suitable diet, rest, and bismuth in these chronic cases.

**Diseases of Children.**—By GEORGE M. TUTTLE, M.D.; and PHELPS G. HURFORD, M.D. Third Edition. Publishers: Lea and Febiger.

THIS is a compact, handy and comprehensive work on diseases of children.

Almost every topic has been re-written and extended to bring it into line with the more recent advances in pediatrics.

The book covers the whole range of diseases of children and should be valuable to students or as a handy book of reference to practitioners.

In the chapter on malaria the writer advocates that "an infant, one year old, should be given 12 to 16 grains a day until the fever remains normal." This dose would seem larger than is customary or necessary.

The arrangement follows that of ordinary works of medicine.

**Infant Feeding.**—By CLIFFORD G. GRULEE, M.A., M.D., Assistant Professor of Pediatrics, Rush Medical College, etc. Third Edition. Publishers: W. B. Saunders Company. 15s. net.

IN this the writer endeavours to bring the scientific knowledge in regard to infant feeding up to date, and to put forth the practical application of those principles so as to bring the work within the grasp of the practising physician. The book is based on lectures given to students at the Rush Medical College.

The metabolism of the infant, and the bacteriological flora of the intestines receive special attention. There are also useful chapters on breast feeding and artificial feeding in health and disease.

The writer considers the two-hour interval for feeding new-born infants too short as the stomach never gets empty. He advocates four-hour intervals and says there is no better prophylactic for over-feeding and colic.

Altogether this book will well repay perusal. The subject is one of general interest, and the writer has succeeded in producing an up-to-date volume, which should be of great use to the physician.

## Medical Society.

### I.

#### THE WELSH HOSPITAL MEDICAL SOCIETY.

THIS, the first War Hospital Medical Society in India, was formed soon after the establishment of No. 34 (The Welsh) General Hospital at Deolali in 1916, with the then Commanding Officer (Col. A. W. Sheen) as President, and Lieut. V. A. Crinks, R.A.M.C., as Secretary.

All Medical Officers in the Station and District were invited to become members, and steps were taken also for the formation of a Medical Library.

The first meeting was held on September 21, 1916, and at this and the following one, discussions took place on the epidemiology and clinical aspects of the outbreak of cholera, which occurred almost synchronously with the arrival of the Unit in the station.

Meetings of the Society have been held since then regularly, on an average, about once a month; and papers have been read and discussions held on the following subjects:—

"Trench Nephritis," by Capt. McKenzie Wallis; "Six Months' Laboratory Work in a General Hospital in the Tropics," by Capt. MacAdam; "Disordered Action of the Heart," by Lieut. S. B. Turner; "Epidemiology of Deolali," by Capt. Cairns; "Cerebral Decompression, with Special Reference to its Employment in Epilepsy and Chronic Headache," by

Major Bathe Rawling; "Functional Disorders of the Central Nervous System with Special Reference to Shell-shock," by Major Owen; "Venereal Disease in its Relation to Active Service," by Captns. Howarth and MacAdam; "Some New Antiseptics," by Capt. McKenzie Wallis; "Medical Impressions of West Africa," by Capt. Walker; "History and Epidemiology of Plague," by Capt. Cairns; and on "Liver Abscess," by Capt. Harvey.

On other occasions the meetings have been occupied by the discussions of clinical cases of interest in the hospital, illustrated, when possible, by pathological specimens. Subjects such as—"Thyroid Enlargements," "Cases of Epilepsy after Trephining," "Cases illustrating Nerve Injuries from Bullets," "Sprue," "Ruptured Kidney," "Sprengel's Shoulder," "Anthraxæmia," "Injuries to the Vascular System," "The Varying Clinical Manifestations of Malaria," "Skin Grafting," "Gas Gangrene," "Trypanosomiasis," "Syringomyelia and Tumours of the Spinal Cord," "Cystic Hygromata of Cheek and Eye," "Filarial Fever," have been dealt with and illustrated at the various clinical meetings.

On relinquishing the Command of the Hospital in October, 1917, Col. A. W. Sheen read a paper of signal interest before the Society, entitled "A War Hospital in an Indian Cantonment." At the close of the meeting, he was thanked for his address and unanimously elected Hon. President of the Society: and Lieut.-Col. Maturin unanimously appointed President.

More recently, several very interesting cases that have occurred in the hospital have been shown or discussed, *e.g.*, "Cases of Kala-Azar after Treatment"; "Baghdad Boils"; "Leprosy," etc.

## II.

### BOMBAY WAR HOSPITALS MEDICAL SOCIETY.

A MEETING of the Bombay War Hospitals Medical Society was held in the Freeman Thomas War Hospital, on 1st August, 1918. Colonel Sheen, A.M.S., was in the chair. The following cases were shown:—

1. A case of P. U. O., by Dr. A. M. Headwards. The case was one of 5 months' duration, showing an irregular temperature, enlarged liver and spleen with a marked leucopenia. No L. D. bodies found on liver or spleen puncture. Major Hamill, R.A.M.C., read notes of a similar case in the Colaba War Hospital, and of 3 cases of long continued fever met with in Bombay, and suggested the possibility of a temperature habit. Colonel Nott, I.M.S., mentioned a similar case in the Victoria War Hospital, and gave his experiences of long continued fevers met with in Bengal. Major Row, from the blood picture, considered the case to be one of tuberculosis.

Dr. Headwards, in her reply, thought the case was one of pseudo kala-azar.\*

2. A case of primary excision of the head of the radius following injury, by Captain G. W. Bury, R.A.M.C.

3. Osteoporosis of the skull, by Captain Subawala, I.M.S. The case showed marked frontal headache, at first thought to be sunstroke, but it responded to potassium iodide and was considered to be syphilitic in spite of a negative Wasserman. Colonel Nott suggested new growth, while Major Hamill thought it was a gummatous degeneration of the skull. Colonel Sheen considered the case to be of an unusual type if it was syphilitic. The therapeutic diagnosis with potassium iodide did not necessarily mean syphilis.

4. A case of knee-joint injury of an unusual type, by Captain Subawala, I.M.S.

5. Sarcoma of the jejunum, by Captain Pestonji, I.M.S. The specimen as well as sections were shown. The interesting point about this case was that the patient showed no symptoms.

6. Captain Engineer, I.M.S., showed a specimen of Aortic Aneurysm. The history had been given at a previous meeting.

7. A case of appendicitis with fits of unconsciousness following operation, by Capt. Subawala, I.M.S. The chief point of interest was that the patient was reported to have an eosinophilia of 82 per cent. The discussion, in which many took part, mainly criticised the possibility of this high percentage of eosinophiles.

8. Partial fracture of the tibia, by Captain Pestonji. This was a subperiosteal fracture, undiagnosed except by X-rays.

9. Relaxation splint for musculo-spiral paralysis, by Colonel Sheen, A.M.S. The advantages and necessity for this kind of splint were clearly brought out and also the dangers attached to many varieties in use. Major Hamill showed a splint.

\* (Do not these cases resemble the long fever of Mesopotamia described by Sprawson and Mackie in our September (1918) number? *Ed.—I. M. G.*)

## ANNUAL REPORTS

### THE COLOMBO HEALTH REPORT.

THIS interesting report has been submitted by Dr. Wm. Marshall Philip, D.P.H., the Medical Officer of Health. We make the following extracts of interest:—

**Housing.**—The question of Housing in Colombo is a serious problem, the accommodation being far short of the requirements. This makes the work of dealing with houses unfit for habitation very difficult, and it has recently been suggested (53 of 31st January, 1918) that as the landowners are hanging back in the matter of building houses suitable for the poorer classes, the Council should give a lead by building a sufficient

number of model tenements to accommodate all the workmen whom they employ in their service.

**Infantile Mortality.**—Thus one finds that the highest average infant ward mortalities occur in the wards with the highest average densities, which in turn denote the existence of slums, and it is not to be expected that the infant death-rate of Colombo will fall to what may be considered a satisfactory level, until these slums have been abolished. This, as has been explained elsewhere in this Report, can only be achieved as the result of carrying out of large schemes of improvement and rehousing on sanitary lines, as provided for in Ordinance No. 19 of 1915. Another very important sanitary measure in connection with the infant mortality here is the abolition of the insanitary, fly-breeding and disease-spreading dry-earth latrines, and the substitution of water-carriage, in which respect the progress made hitherto has been painfully slow, although sewers are now nearly everywhere available in the more densely populated parts of the town.

**Tuberculosis.**—Following upon this the Government appointed a Commission in January, 1910, to inquire into and report upon Tuberculous diseases generally in Ceylon, and upon the most effective measures for checking their dissemination. Their report dated 6th June, 1910, endorsed most of the recommendations contained in the report referred to above, including (a) the introduction of compulsory notification, (b) the establishment of a hospital for advanced cases, (c) the segregation of the sick from the healthy, (d) the establishment of sanatoria, (e) the education of the people in matters relating to the prevention of Phthisis, (f) the prevention of spitting in public places, and the abolition of coir mats as spittoons, (g) the prevention of dust, etc., etc.

In addition the Commission made the important recommendation that an Anti-tuberculosis Dispensary should be established in Colombo, on the lines of the original one which was founded by Sir R. W. Philip in Edinburgh.

As a result of all this investigation and representation, the following measures were subsequently adopted, and have without doubt had their share at various stages in reducing the mortality from Pulmonary diseases.

Phthisis was made a compulsory notifiable disease in August, 1910.

Spitting in public conveyances and public places was made a punishable offence by by-law in November, 1910.

The evacuation and closure, pending improvement, of houses unfit for habitation was rendered possible by the advent of Plague which automatically brought the Plague Regulations in respect of such buildings into force in January, 1914.

The Anti-tuberculosis Institute was opened in October, 1916.

The Hospital at Ragama for advanced cases of Phthisis was opened in February, 1917.

To sum up, therefore, the improvement in the mortality from Pulmonary diseases, which has been going on during the period 1909 to 1917, has been due chiefly to the following:—

*From 1907.*—Improvement in the lighting and ventilation of insanitary tenements.

Improvement in the general cleansing and scavenging of the town—especially (since 1909) in the matter of dust prevention. The effect of both of these measures would necessarily be cumulative and take some time to produce any effect upon the death-rate.

**All Fevers.**—Cases 490; Deaths 239; Death-rate 0.92 per 1,000. Under this heading are included Enteric fever with 424 cases and 174 deaths; Continued fever with 66 cases and 20 deaths; Remittent fever with 44 deaths; and Intermittent fever with one death.

The death-rate from this group of diseases gradually fell from 3.75 in 1897 to 2.01 in 1905. It then rose to 3.28 during the abnormally unhealthy year of 1906, and as a result, a great deal of Enteric infection was

implanted in the town in the shape of 'carriers' and otherwise. Since 1906 it has with two exceptions steadily fallen, the exceptions being the years 1911 and 1916 during each of which there was a slight set-back in respect of Enteric fever. Every race has shared in the improvement, and none so strikingly as the Europeans whose rate is however liable to fallacious variations owing to the smallness of the community and their habit of migrating to England. Thus since the War began, although there are no complete statistics available, it is well known that a large number of the young and susceptible males have left Ceylon and this no doubt accounts to some extent for the very marked drop in their mortality from Enteric fever which has occurred during the last three years.

**Enteric Fever.**—Cases 424; Case-rate 1.64 per 1,000; Deaths 174; Death-rate 0.67 per 1,000.

The incidence of Enteric fever in proportion to the population of each race was highest amongst 'Others' (4.61 cases per 1,000); next come Burghers (3.43); then Singhalese (2.03). Europeans (1.94)—compare which with the European case-rate of 23.5 in 1908.

The case mortality ranged from 14.3 per cent. amongst European cases, to 66.6 per cent. amongst Malay cases—this latter case mortality strongly indicating non-notification of mild cases.

**Plague.**—This experience confirms the conclusion which had previously been arrived at that *evacuation and closure of insanitary dwellings is by far the quickest and most effective of the measures for the prevention and suppression of Plague, in insanitary areas.*

The effect of evacuation appears to go further than merely the removal of the occupants from immediate danger. It appears very often to have the effect also of stamping out the disease amongst the rats in the locality. The healthy, vigorous, hungry rats no doubt move into the adjoining occupied areas in search of food, while the Plague rats, on the other hand, especially those in the acute and most infectious stages, have no desire for food, are languid, weak and in the later and most infectious stages are even parietic, and in consequence probably remain for the most part in and die in their tunnels or are killed there later by the fumigation. The rat fleas which live and breed in the rat nests being thus deprived of both human and rat hosts perish in a very short time and thus the place becomes plague-free. No doubt a certain number of rats in the early stages of the disease, or suffering from chronic Plague, or "carriers" still retain sufficient vitality and interest in food to range away from the evacuated dwellings into the adjoining areas, but the system of establishing a circle of Clayton fumigators around the infected house and working towards it as a centre tends to prevent migrations of this sort.

**Mosquito and Fly Prevention.**—With a staff of only 1 Sub-Inspector, 6 Overseers and 12 Coolies, for both mosquito and fly work throughout the whole town, it is obviously not possible to do much towards prevention of either, especially in the absence of legislation making the householder and the owner of the property responsible for preventing the breeding of mosquitoes or flies on their premises. As everyone knows, the average householder will do practically nothing in sanitary matters unless he is required to do so by law. The very fact that there is no specific law on any particular subject induces those who have not had the necessary scientific teaching to enlighten them, to believe that any attempt on the part of officials to enforce preventive measures is merely an unwarrantable and vexatious interference with their liberties, which they are liable to resent accordingly.

Notwithstanding the smallness of the staff and the lack of specific powers for dealing with insect pest nuisances, a good deal of useful work was done during the year, including practical demonstration to householders of mosquito breeding in their premises.

Thus 3,319 premises were inspected in connection with mosquito breeding, with the result that 155,791



'potential' and 4,863 'actual' breeding places were discovered and abolished during the year. By 'potential' breeding place is meant any receptacle or place which is capable of holding water and which is either found with water in it or is in such a situation that water—rain or otherwise—could gain access to it; but which at the time of inspection had no mosquito larvæ in it. By 'actual' breeding places are meant all collections of water in which mosquito larvæ were actually found at the time of inspection.

It is unfortunate for the safety and comfort of the inhabitants of Colombo that the very practical recommendations which were submitted 4 years ago by Lieutenant-Colonel James, I.M.S., after a year's work in connection with mosquitoes in Colombo, have not yet been given effect to, even in the simple matter of making it a punishable offence for householders or owners of property to permit the breeding of mosquitoes on their premises.

The special work in connection with the prevention of fly-breeding consists chiefly of an attempt to prevent (a) the open storing of manure for gardening purposes, (b) the topdressing, with dung and other filth, of grassfields in proximity to residential quarters, (c) the location and abolition of special breeding places.

#### LAHORE HEALTH REPORT.

THE first impression one receives in opening this huge report is that the Lahore Municipality has plenty of money to spare and that there is no paper shortage in the Land of the Five Rivers.

Dr. A. B. Arora, the energetic Health Officer of the Municipality of Lahore, has submitted a long and valuable report. It is valuable as the extracts below will show, but that it is long and that it is expensive will be clear when we say that it consists of 91 pages and has a very large number of costly if graphic coloured charts and tables.

If single municipalities are to report on this scale, their paper and printing bills will mount up considerably.

Apart, however, from these extravagances the report is full of interest. The meteorology of the year is described and illustrated by no less than five graphic charts, but except for a "phenomenally vigorous monsoon" there is little of present interest in the remarks on this heading, but we must protest against five charts, four of them coloured, being used to illustrate the simple facts of the text.

The death and birth rate are elaborately detailed and a wealth of colour displayed in the rates in the various wards of the city. The birth-rate was 37.1 per mille, but the death-rate was excessively high, 43.3 per mille, and the Report tells us that this high rate was practically the same as in other towns in the Punjab and notably better than in some, e.g., Multan, is credited with a rate of over 52, Amritsar over 66, Rawalpindi over 44. On this Dr. Arora comments as follows:—

The death-rate in Lahore has been going up since 1915, which period synchronised with the period when the effects of war conditions on the population had begun to manifest themselves. In addition, the climate and weather conditions, not only during the year under

report but also in 1916, and heavy rainfalls, which contributed so much to swell up the mortality figures, have, as some people seriously surmise, a great deal to do with the amount of powder and shot that is being spent in the greatest war ever fought in human history. That the atmospheric disturbances and the changes wrought in the chemical and physical conditions of air have a lot to do with the vagaries of the weather (which is not confined to Europe alone) is a statement which contains many elements of truth requiring investigation.

Will the "powder and shot" theory also account for the serious shortage in the rains complained of at the time of writing (mid-August)?

The females' death-rate is high and apparently increasing, the average of five years being 28 for males and 40 for females, and the females' death-rate rose to 43 in 1916, and to 53 in the year under report.

Is this due to the greater energy of Dr. Arora's staff in registering deaths or due to the following causes which are thus forcibly described by that officer?

The constantly increasing death-rate amongst the female population is a matter which ought to engage serious attention. One of the main causes of the excess of deaths in females is the burden of maternity which they have to bear. It is not the old untrained and dirty *dhai* alone who is the chief factor in swelling up the mortality, but the social and semi-religious notions of the people themselves who not only choose the dirtiest and darkest room in the house for purposes of confinement but mistaken ideas of treating a woman in confinement as a sort of 'untouchable' and consequent want of proper nursing and care at one of the most critical periods in a woman's life which are equally important factors in bringing about this tragedy.

There is a field for reformers!

Under these circumstances we need scarcely say that the infant mortality is extremely high, the highest recorded since 1909, viz., 322 per mille.

Dr. Arora's caustic comment is here quoted:—

"This enormous loss of infant life is the greatest continual economic loss sustained by any nation and the chief factor, in addition to the utter ignorance of the elementary principle of domestic hygiene on the part of the mother, is the little care and attention paid to the washing, clothing and feeding of the babies. Who does not know that in the Indian home, the busy mother, if she does not entrust the whole care of the baby in the hands of its elder brother or sister, hardly a decade old, for the major portion of the day, devotes as little time as she can spare for washing, dressing or properly feeding the baby? And the results are, as we all know, disastrous!"

The need of the hour is the organisation of the infant welfare work—the object of which should be to save the lives of babies and make them grow into healthy, vigorous and useful children and future citizens by giving practical demonstrations to the mothers—present or prospective—both in their homes and at fixed centres—as to how to wash, clean, clothe, feed and nurse the baby.

As I mentioned in my last report, Mrs. Mary Caleb started an Infants' Welcome in Mozang on the 25th March, 1916, and this work was also continued during the year under report. The epidemic of plague in Mozang did not allow the work to expand as much as one would have liked to. But whatever useful work could be done was due solely to the selfless zeal and devotion to work shown by Mrs. Caleb.



**Plague.**—In 1916 Lahore was free of plague, but as Dr. Arora says, "the gods are jealous" and there was a very virulent and extensive outbreak in 1917. The Health Officer asked for a campaign of house-cleansing and regular inoculation, but the Municipality did not agree and suggested fumigation and popularising inoculation by "writing letters," "advertising," "beating of drums," and the "issue of handbills," and free distribution of phenyle—"very mild" measures as Dr. Arora calls them.

**Cholera.**—Only 85 deaths.

**Small-pox.**—Twenty-three deaths, the old 3-year recurrence theory has broken down.

**Measles.**—Twenty-six cases reported. There had been a severe epidemic in the previous year.

**Tuberculosis.**—Five hundred and eighty-four deaths registered, the Tuberculosis Institute is doing good work and 3,011 new cases attended for treatment.

**Malaria.**—This was not in epidemic form.

The following note on the Tuberculosis Institute is worth reproducing:—

The subsequent visits of the patients treated at the Institute during the year amounted to 9,890 as compared with 6,685 in 1916, 3,321 in 1915, 2,336 in 1914, and 2,276 in 1913. Thus the total number of attendance of both new and old patients at the Institute during 1917 was 12,901 as compared with 8,160 in 1916, 4,042 in 1915, 3,044 in 1914, and 3,353 in 1913.

The notable feature of the year has been the appointment of a Lady Health Visitor at the Tuberculosis Institute. This has led us to devote more attention to the home conditions of the patients than was possible for us heretofore. After the first examination of the patient at the Institute the best step is to investigate the home conditions and surroundings. The Lady Health Visitor visits the patients' homes and gives them advice on the spot as to the improvement of the house and faulty conditions, if found. The other members of the family are instructed in precautions to be taken to guard against the spread of infection. Disinfection of the dwellings is usually arranged and carried, after the family moves or a death from phthisis occurs there.

Considerable progress has been made in the supremely important work of examining the contacts. With one Health Visitor at the Institute it has not been found possible to examine the contacts to every definite case of phthisis examined by me. Only the more suspicious cases amongst the contacts are subjected to examination, and in this way early cases are brought to light, who, in ordinary course, would never have consulted a medical man, until very late in the course of the disease. It is very hard to convince these cases that they are suffering from tuberculosis. Most of them persist in believing that they suffer from cold and not infrequently they treat it themselves. These cases are source of great danger to other members of the family, as they spit carelessly about the house. Great attention is paid to diagnosis and treatment of these cases, because I consider this to be one of the most valuable and useful measure in the prevention of tuberculosis. The percentage of such cases examined and found tuberculous is 20 per cent.

As we have shown above, the report is a valuable one and shows that Lahore is in the possession of an able and energetic Health Officer.

## THE DELHI HEALTH REPORT.

Another voluminous report on a Municipal town! These reports nowadays rival the provincial reports in size; here we have 67 pages on the healthy Delhi Municipality in 1917.

It is good to read that Delhi was free from plague and cholera. The birth-rate was over 53 and the death-rate was 36 per mille. A progressive decline in the infantile mortality is satisfactory, and the report tells us that the rate has been "overestimated" in recent years.

We make the following extracts:—

**Malaria.**—In my last year's report I have given a detailed note under this heading and pointed out the various places where mosquitoes thrived in large numbers. I noted the places where anopheles stephensi, the most common malaria-carrying mosquitoes, and other species of anopheline mosquitoes were generally found to breed. To avoid repetition in detail I would here only mention that further investigations have strengthened my convictions on this subject and no pains have been spared to reduce the disease to its practicable minimum potency. The results have been good. Several medical practitioners have repeatedly expressed their surprise about absence of malaria in the city. The heavy showers of rain scoured a large number of mosquito-breeding places.

In my last report I have also stated under the heading "Treating of mosquito-breeding places," the experiments I carried out with the bleaching powder and its effect on mosquito-larvæ and pupæ. These experiments were continued this year with similar results, except that the requirements of the quantities of bleaching powder to kill these larvæ and pupæ varied considerably in the different pools. I believe this was on account of variations in the presence of vegetable matters in the pools.

During the year under report 59 wells were provided with mosquito-proof covers and trap doors, 675 wells were disinfected, and several small depressions were either filled in or disinfected.

The reclamation of the military portion of the Bela was taken in hand. The storage water-tank in the Railway yards which were breeding mosquitoes in them were covered over.

The anti-mosquito-gang was kept active in its work throughout the whole year.

**Phthisis.**—The wide prevalence of this scourge in Delhi was remarked upon by me last year, and I have repeatedly pointed out how the disease is favoured. The congested areas, ill-ventilated rooms, overcrowding in small tenements, narrow and tortuous alleys, combined with ignorance and apathy of the people, are the factors which conduce to the spread of phthisis.

I would once more draw the attention of the Municipal Committee to the results of my examinations of the school children for Scrofular Glands, and here I would again urge strongly the need of having a tuberculosis dispensary in the city at an early future.

In the absence of a laboratory in Delhi the disease is rarely diagnosed in its first stage. A tuberculosis dispensary will naturally afford facilities for early diagnosis of the disease, and it certainly should be an institution where relief could be afforded in mild cases of the disease.

The western extensions of the city are now getting more popular, and it is gratifying to see some of the people shifting from the city to these open and freely ventilated areas.

Two hundred and forty deaths from phthisis were recorded during the year under review, of which 72 occurred amongst males and 168 amongst females. The

above figures do not give a correct index of the actual prevalence of the scourge and hence these figures are quite deceptive. Unfortunately a large number of deaths from phthisis are notified under the traditional heads 'Fevers' or 'Coughs' and many deaths which have actually occurred from phthisis are recorded under these heads.

In May, 1916, I submitted a detailed report to the Chief Commissioner, on the subject of prevalence of tuberculosis in Delhi City. The disease requires to be grappled from several sides, and the complete scheme to fight against this scourge cannot be taken in hand at once on account of lack of funds. But still a start should be made and it should be by opening a tuberculosis dispensary in the city."

**Adulteration of Ghi.**—In my last report, I reported on the coming into force of ghi bye-laws. The instruments for analysis of ghi samples which were ordered from England did not arrive during the year, so the operations of the bye-laws had to be withheld. The instruments have just been received.

A few samples of ghi were analysed with the usual result, *viz.*, nearly all samples were found adulterated with foreign fat.

Section 150 of the Punjab Municipal Act III of 1911 demands a cumbersome procedure before a legal suit can be brought against an offender; it demands (a) that the sale should be complete and (b) that the article sold to the prejudice of the purchaser. The wholesale dealers refuse to sell ghi in small quantities and thus it was found difficult to get samples from their shops. The ghi sellers recognising the staff of the Health Department freely acknowledged that the stuff they sell has been adulterated. Those incidents created some difficulty, but which will certainly be removed when the ghi bye-laws come into operation as the principal clause in the bye-laws is as follows:—

"No person so licensed shall sell or expose for sale butter or clarified butter (ghi) to which any foreign fat or oil has been added unless such butter or clarified butter (ghi) is contained in a vessel or canister plainly and conspicuously painted on all sides and on the top with a red stripe at least three inches in width."

This bye-law brings to an end the two chief difficulties mentioned above, and simplifies the taking of samples from canisters and institution of legal actions against the offenders.

**Fly reduction.**—The year was on the whole remarkably free from fly pest, except in the third week of February when on account of sudden rise in temperature, the hibernated flies emerged and became a real pest not only in the city, but in all its surrounding areas. The nuisance was brought very rapidly under control by the prodigious use of sticky stuff, formalin baits and anti-fly sprays.

In one of my previous reports I remarked that melon farms on Bela bred flies in large number. The Chief Commissioner has passed an order disallowing cultivation of melons within the city limits, thus one more step was taken to diminish the fly-breeding area.

The Report is signed by Dr. K. S. Sethna, D.P.H., the Health Officer.

#### THE BOMBAY SANITARY ASSOCIATION.

We have received the report of this Association, which was inaugurated in 1904, and whose aim is to create an educated public opinion on sanitary matters. It is a pity that nine members do not attend the meetings of the Association—with a roll of 125 members the average attendance was only seven!

The League for Combating Venereal Disease is a new sign of the activity of the Association, and the following resolutions were passed:—

1. That in view of the great prevalence of Venereal Diseases in Bombay and of their grave consequences, this Conference of Medical men assembled is of opinion that the time has come when the Public and the State should be roused to the gravity of the situation, and induced to take measures to prevent them.

2. That a League for Combating Venereal Diseases, consisting of Medical and laymen, be formed to educate public opinion and to devise and assist in carrying out all such measures as are calculated to prevent the spread of these diseases.

Other activities of the Association are the maternity homes for the poor, at the instigation of H. E. Lady Willington, lectures to *dais*, infant milk depôts, and anti-tuberculosis work.

The opening of a new Sanitary Institute, built at a cost of nearly 1 lakh of rupees, is a step in advance. The following is a description of the Institute:—

On the ground floor of the building are located the headquarters of the King George V Anti-Tuberculosis League, the Secretaries' Office and Information Bureau, a Tuberculosis Dispensary and Laboratory and a Museum of various models and exhibits. The first floor comprises a large lecture hall which is fitted with electric apparatus for magic lantern and cinematograph demonstrations and is designed to be a theatre where discourses on subjects relating to sanitation and public health, sanitary engineering, and town planning are held and matters connected with trade processes and occupations can be dealt with; attached to the hall are a library of literature on sanitary subjects and a Museum containing the most modern sanitary models, diagrams and appliances, so as to provide facilities for instruction to all students of sanitation in all its branches. The second floor of the building is occupied by the Office of the Special Assistant to the Health Officer for Malaria with a Laboratory and the Office of the Secretaries of the League for Combating Venereal Diseases.

#### ASSAM ASYLUM REPORT.

MAJOR J. W. MCCOY, I.M.S., was in charge of the Asylum at Tezpur during 1916-17. The daily average strength increased to 341 in 1917. Sixty-three lunatics escaped during the three years and complaint is made of the known difficulty of getting good keepers (at the present low rates of pay). The chief form of insanity was mania, and then melancholia.

The following table shows the percentage of death rates in Indian asylums in 1917:—

|                   | Per cent. |
|-------------------|-----------|
| Assam             | 5.56      |
| Burma             | 6.78      |
| Bengal            | 7.91      |
| Madras            | 9.04      |
| United Provinces  | 9.27      |
| Central Provinces | 10.08     |
| Bombay            | 10.1      |
| Bihar and Orissa  | 11.68     |
| Punjab            | 12.31     |

#### BIHAR AND ORISSA SANITARY REPORT.

The Bihar and Orissa Annual Sanitary Report for 1917 is written by Major W. C. Ross, D.P.H., I.M.S., the Sanitary Commissioner.

The provincial birth-rate is given as 40·4, with a ten-year average of 39·9.

The following table gives the birth-rates in other provinces in India:—

|                              | Per cent. |
|------------------------------|-----------|
| Bihar and Orissa             | ... 40·4  |
| Bengal                       | ... 35·9  |
| Central Provinces            | ... 48·1  |
| Madras                       | ... 32·3  |
| Burma                        | ... 36·2  |
| Bombay                       | ... 35·7  |
| United Provinces             | ... 46·0  |
| Punjab                       | ... 45·3  |
| Assam                        | ... 31·3  |
| North-West Frontier Province | ... 32·1  |

"The results of the check on vital occurrences by the Health Officers in the twelve large towns in the province have again been disappointing. This is largely due to the fact that in six of the twelve towns, viz., Gaya, Arrah, Muzaffarpur, Darbhanga, Bhagalpur and Ranchi, there has been no Health Officer for a considerable part of the year and especially this has been the case in the latter half of the year. The Health Officers of Cuttack, Gaya, Chapra, Monghyr, Puri and Deoghar appear to have carried out the new orders in a thorough and efficient manner. The Health Officer of Cuttack in particular has done this work remarkably well and has returned a record of 1,358 births and 1,250 deaths against police returns of 1,063 and 833 respectively. The returns of the other six towns are unsatisfactory, in some cases incomplete, and in general of little value."

The provincial death-rate was 35·2 as compared with the ten-year average of 32·9.

**Cholera Preventive Measures.**—In previous years, District Boards and Municipalities had been using Potassium Permanganate more and more freely for the prevention of cholera, but during 1916 Potassium Permanganate became very expensive and difficult to obtain, and accordingly I issued a general circular advising the use of quick-lime for the disinfection of wells as a temporary measure. Chlorogen has also been largely used as a disinfectant for wells in municipalities. In connection with the cholera epidemic in Hazaribagh, I issued a report with particular reference to the cause and prevention of cholera to all Government and District Officers and to District Boards and Municipalities throughout the province.

Is "quick-lime," as obtainable in India, quick? Is it reliable? We understand Mesopotamian experience is against its use.

**"Malaria.**—The following measures are being carried out:—

- (1) The energetic distribution of quinine free, both in treatment and as a prophylactic.
- (2) Investigation as to the varieties of mosquitoes prevalent in the selected areas and their particular breeding places.
- (3) The collection of information and statistics as to the prevalence of malarial fever and of enlarged spleens.
- (4) Some blood examination work, if possible, so as to determine the nature of the malarial infections which are prevalent.
- (5) Preventive measures against mosquitoes, viz., the discovery and removal of their breeding places where these are small and the application of kerosine oil, where possible, where these are large, and also the removal of grass, weeds, and jungle growth round the edges of large water collections."

**"Sale of Quinine.**—There was a marked increase in the consumption of quinine in the province during 1917, the number of pounds used being 1,429·9 as compared with 962 pounds last year. The largest quantity of quinine was taken by Manbhum and Purnea districts, 254·1 and 182·8 pounds respectively. The consumption of quinine in all the districts of the province except

Darbhanga showed an increase, and in the districts of Manbhum, Purnea, Bhagalpur, Palamau, Cuttack, Singbhum and Champaran the increase was very marked.

I had anticipated an increase in the consumption of quinine (as noted in last year's report), but I had not expected an increase amounting to nearly 50 per cent., and I am doubtful if this increase is all in the direction of direct distribution to the consumer. I have submitted separate reports on this matter to Government. I fear that the large difference in price between Government quinine and the supplies available on the open market is responsible for fictitious sales, which do not go direct to the consumer, and I anticipate that there may be another startling increase in the quinine sales next year.

Quinine was generally sold through the agency of postmasters, drug-vendors, vaccinators, shop-keepers and village headmen, and the school-masters working under the District Board in rural areas in Palamau.

**Malaria Lecturers.**—During the year three malaria lecturers were at work in the districts of Shahabad, Purnea and Cuttack. Each of the lecturers was equipped with a magic lantern, a set of slides and standard lecture in vernacular, and was provided with quinine treatments for free distribution and a small outfit of medicines for the treatment of casual cases."

On the subject of rat-killing and plague prevention, we quote the following: we must, however, bear in mind that rat-destruction must be thorough and continuous and not spasmodic or half-hearted:—

**"Plague Prevention.**—The general conclusion which I am compelled to draw from the experience of plague preventive measures in past years is that outside interference can accomplish little when it is opposed by the inertia and the prejudices of the people who dislike inoculation and will not take the trouble to get rid of rats in their own houses. No measure unless it is generally adopted can have any great preventive value, and I am convinced that rat-killing by public agencies is essentially a failure because it does not accomplish the destruction of any appreciable number of rats. The only plague preventive measure which has any practical value at present is evacuation, and the value of that measure lies in its general acceptance by the people who understand its benefits and who carry it out promptly, now that they have learned the lesson of its importance."

Major Ross sums up as follows:—

"Sanitary progress is slow and sanitation remains in a static condition, chiefly because of the ignorance and inertia of the people themselves, and partly because there is no apparent source of the expenditure which must necessarily be incurred.

If progress is to become more rapid and more real, the methods of advocating and enforcing sanitary reforms must be made more effective and altered so as to appeal more directly to the minds of the people. Something can be accomplished by compulsory legislation, but no real and permanent advance can be made until the physical and economic benefits of sanitary reform are impressed upon the popular mind in a popular manner.

A little knowledge may be a dangerous thing, but at any rate some knowledge of elementary facts and of the modern theories which are based upon them would be preferable to complete ignorance and might reasonably be expected to lead to a demand for greater knowledge.

I would, therefore, advocate a slow but definite programme of legislation involving a gradual advance in the standard of sanitation required in communities, with a view to enforcing the idea of citizenship and responsibility in sanitary matters. The education of the popular mind in sanitary matters has now been

taken in hand by the Press and Publicity Bureau, and I hope and anticipate that this work will become more extended and more useful from year to year. With this work in progress, it should become more easy and it is certainly more necessary that the scope of sanitary legislation should be extended and that it should be more strictly enforced.

## Correspondence.

### GNATHOSTOMUM SIAMENSE OR GNATHOSTOMA SPINIGERUM, OWEN.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—The following case by reason of its great rarity deserves to be reported :

On 16th April last, a male Chinese cooly, aged 23, was admitted to the Nordanal Estate Hospital, Muar (Johore), complaining of pain and swelling of the middle finger of the right hand.

*Previous history.*—The cooly had stayed on the Estate for about a year and had ankylostomiasis infection before.

On examination I found the middle finger and the back of the right hand were slightly swollen, hot, and painful. The temperature was 100.6° F. on admission. (Afterwards, except for a day or two, the temperature was practically normal.)

Heart, lungs and other organs, normal. Blood : Hæmoglobin 60-70% ; no parasites found ; Leucocyte count : Polymorphonuclears 83%, Large mononuclears 15%, Lymphocyte 5%, Eosinophiles 4%. Urine, normal. Stool, no ova found.

*Treatment.*—A purge was administered and some antiphlogistic poultice was applied to the inflamed parts.

20-4-18 : the right wrist was slightly swollen, hot and painful.

21-4-18 : the abscess on the finger was opened, and dressed with hydrogen peroxide.

### A TENACIOUS CASE OF TETANUS AND THE EFFECT OF ANTI-SERUM.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—K's mother, H. I., 48, suddenly developed convulsions at 5 P.M. From the description of the nature of convulsions it seemed they were opisthotonic and pleurothotonic. A local native doctor, called in, injected 20 m. ether hypodermically. I arrived next day, at 12 noon. Found patient semi-comatose. Lockjaw present. Back muscles moderately stiff. No convulsions. Very slight perspiration. Pupils—equal, slightly dilated. Temperature sub-normal. Respiration—27 per minute. Pulse—100, regular, weak. No history of any injury except that on the day before the patient picked her teeth with a dirty piece of thin, split bamboo and there was about half an ounce of blood from bleeding. Patient lives on ordinary Hindu diet, no stimulants ; vegetarian. No specifics.

*Diagnosis.*—The nature of the spasms was enough to diagnose it as tetanus ; as also the persistence of the lockjaw after the subsidence of the convulsion spasm. But whether it was the traumatic or the idiopathic type it was difficult to say. If that slight injury to the gums be counted, it might be taken as a traumatic case (but it should be noted here that the patient has chronic pyrrhœa alveolaris and she is in the habit of picking her teeth with anything handy that she gets at the time). As such I take it to be an idiopathic case.

*Treatment.*—2nd day.—injected antitetanic serum 3,000 units and prescribed chloral and bromides.

In case the patient is unable to swallow this, an enema of starch solution iv oz., with chloral hydrate 3 gr. to be given. 2nd day,—no spasms.

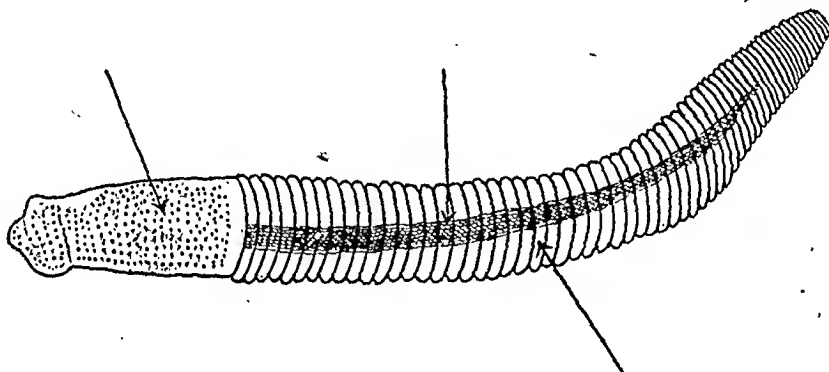
3rd day,—serum 1,500 units. The same medicine. No spasms.

4th and 5th days,—the patient's friends, thinking her all right, continued only the mixture but no serum.

6th day,—patient again getting convulsive spasms with opisthotonus and pleurothotonus. On being called I found lockjaw, and the patient in the same condition as on the 2nd day—though in the interval she could talk and sit up and was in all respects better. I gave her a dose of serum—1,500 units.

7th day,—reported better.

Since then she has been getting a 1,500 units dose of serum daily and was gradually improving. From the 16th day, the serum was stopped by her friends for 4 days and again



20-5-18 : A small abscess on the right thenar eminence was opened and a small worm, about 9 millimetres long by 1 millimetre broad, was removed, alive, from it.

Under the microscope, the anterior third of the worm was of a red colour and beset with spines, followed by scattered simple spines, which gradually became smaller and then disappeared entirely. The remaining portion presented an external white colour and an internal black colour. (A rough diagram of the worm is enclosed.)

It was identified as *Gnathostomum Siamense* and was sent for confirmation to the Director of the Institute for Medical Research, Kuala Lumpur, Federated Malay States.

Dr. A. D. Stanton, the Director of the Institute, was good enough to confirm it as *Gnathostoma Siamense* or, more properly, *Gnathostoma Spinigerum*, Owen (1838).

The patient, who had never been to Siam, left the hospital on 9-6-18, as cured.

The case is an interesting one, for I think, this is the first record of human infection by this worm in the Malay Peninsula.

Yours, etc.,

P. C. SAMY,  
HOSPITAL ASSISTANT.

July 24, 1918

the convulsions recurred on the 21st day. She was given a serum injection at once, and since then gradual improvement is noted in her condition. The serum was continued again, on alternate days, in the same dose.

Condition gradually improving. The whole course was about a month.

This case clearly shows how the antiserum acts in cases of tetanus. It was invariably noted that as soon as the serum was stopped the symptoms reappeared, but the speedy introduction of 1,500 units of the serum brought the patient back to normal condition.

D. R. DHAR, M.B.,  
ASSISTANT SURGEON,  
Tambuk, Dt. Midnapur.

### QUININE PROPHYLAXIS.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—In reference to your note under the above heading in the March Number of the *Indian Medical Gazette*, which contains a quotation from an article of mine published in the *Journal of the Royal Army Medical Corps*, may I trespass on your space to offer an explanation in regard to paragraph 5, which reads as follows :—

"(5) The prophylactic use of quinine may, if circumstances permit, be combined with anti-mosquito measures, but the



energies of medical officers and others must not thereby be distracted from prosecuting the main line of defence, viz.—the inauguration of the efficient system of quinine prophylaxis."

It should be understood that the above paragraph, which was contained in an article entitled "The Prevention of Malaria in War," has reference solely to the prosecution of anti-malarial measures by regimental medical officers in the field. It was elsewhere stated that the main mode of protection in such circumstances should be by means of "bite prevention" measure, e.g., mosquito nets of special type, etc. The point—and a very necessary one—it was desired to emphasise was that during active operations in highly malarious areas the regimental medical officer should in the first place give his attention to quinine prophylaxis, rather than attempt to combat malaria in his unit by carrying out "anti-larval" measures.

The value of these latter measures under other circumstances is an entirely different question, which was not then under consideration.

I venture to offer these remarks lest the above paragraph read alone, without the context, might lead to the conclusion that I had given utterance to a statement which was as dogmatic as it was unscientific.

Yours, etc.,

C. A. GILL,

MAJOR, I.M.S.

#### MODIFICATION OF LEISHMAN'S STAIN.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—As there is now very considerable difficulty in getting Merck's "Methyl Alcohol," which was supposed to be essential for making a solution Leishman's stain, I venture to bring the following modification of Leishman's stain to the notice of readers of the *Indian Medical Gazette*.

The modified stain has now been in use in the Combined Indian Tropical Hospital, Cawnpore, for nearly a year, and I found that it possesses the following advantages:—

(a) All the necessary constituents can be readily got in India.

(b) The stain keeps well.

(c) There is no deposit.

(d) Good contrast staining of parasite and nuclei of leucocytes.

During the wet weather, the solution is prepared as follows:—

B. W's Leishman stain ... one soloid.  
Smith Stanistreet & Co.'s Methyl Alcohol 10 c.c.  
Glycerine ... 5 c.c.  
Potassium Bicarbonate, small crystals ... 2

For the dry weather only 2½ c.c. of glycerine are needed.

To prepare the solution, Put the soloid of Leishman stain and the crystals of potassium bicarbonate in a glass mortar: grind well; add gradually methyl alcohol, mixing well; after all methyl alcohol is added, add the glycerine, shaking well; keep stain twenty-four hours in dark place before using.

Yours, etc.,

"NO NAME."

#### IS ASPIRIN DANGEROUS?

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I have recently heard a discussion between medical and lay men on the dangers of aspirin; can you give me your opinion?

Yours, etc.,

"INQUIRER."

27th July, 1918.

The promiscuous use of aspirin and such drugs cannot be free of danger. It should never be taken on an empty stomach—*Martindale and Westcott*, p. 74.

Since writing the above we have found the following note in *J. A. M. A.* of 2nd March, 1918:—

"In reference to untoward effects from acetylsalicylic acid (aspirin), it is stated in *New and Nonofficial Remedies*, 1917, p. 265: 'The promiscuous use of acetylsalicylic acid (aspirin) by the laity, especially for the relief of headache, has frequently led to cases of rather severe poisoning, the chief symptoms being edema of the lips, tongue, eyelids, nose or of the entire face; also urticarial rashes, vertigo, nausea and sometimes cyanosis. Some persons are especially susceptible to acetylsalicylic acid, and these symptoms are usually ascribed to an idiosyncrasy.' The following is the dosage of acetylsalicylic acid given in *New and Nonofficial Remedies*: 'From 0.3 to 1 gm. (5 to 15 grains), repeated once in three hours until symptoms of salicylism (ringing in the ears, etc.) are noted.'

The following brands of acetylsalicylic acid (aspirin) have been found to comply with the standards of the Council on

Pharmacy and Chemistry for acetylsalicylic acid, and were admitted to *New and Nonofficial Remedies*:

Acetylsalicylic Acid—M. O. W., Mallinckrodt Chemical Works, St. Louis.

Acetylsalicylic Acid—Morek, Morek & Co., New York.

Acetylsalicylic Acid—Milliken, John T. Milliken & Co., St. Louis.

Acetylsalicylic Acid—Monsanto, Monsanto Chemical Works, St. Louis.

Acetylsalicylic Acid—P. W. R., Powers-Weightman-Rosen garton Company, Philadelphia.

Acetylsalicylic Acid—Squibb, E. R. Squibb & Sons, New York.

Aspirin—L. & F., Lohm & Fink, New York.

—ED., J.M.G.

#### "CHUHARIA" ULCER IN MAYURBHANJ AND OTHER NEIGHBOURING PARTS OF ORISSA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—During my service in the State of Mayurbhanj since the rainy season, I had to meet with a number of patients suffering from a peculiar sort of ulcer, idiopathic in origin and indolent in nature. The ulcers are frequent among low classes, mostly aborigines, and being neglected turn into chronic and unhealing ulcers, called by local persons as "Chuharia."

As far as I have observed and collected the prominent factors of the peculiar disease, I reproduce as follows:—

**ÆTIOLOGY.**—If you ask any patient how the disease formed, he will at once say that "Chuharia" has no cause and it comes of itself. But nothing in this world is without cause, though may be hidden from our eyes. I have traced the origin of the disease as follows:—

##### 1. PREDISPOSING.

(a) *General.*—Senile debility; general and nervous debility due to acute illness. Irregular and unbolled feeding, etc.

(b) *Local.*—Long exposure to cold, damp and moisture, and dirty condition of the skin.

##### 2. EXCITING.

(a) *General.*—This is the most important of all the causes. I have found and traced most of the patients suffering from "Chuharia" ulcer succumbed to the ulcer immediately after an attack of rheumatic fever. The fever produces neuritis in particular parts, mostly limbs, and after that eczematous patches or eruptions occur, which, being in a neglected condition, produce a number of rough and scabious ulcers.

(b) *Local.*—Among the local of the exciting sources, I cannot but mention only one, most common among the low classes, and that is—negligence.

##### VARIETIES.

(1) *Parietal.*—These ulcers run alongside the skin and never go deep beyond the skin. The chief peculiarity of this ulcer is that the edges are irregular and the ulcer is edematous and full of unhealthy granulations.

(2) *Deep.*—These run deep in the tissues producing partial necrosis of soft tissues and even to bones.

(3) *Gangrenous*, mostly of moist variety.

**SYMPTOMS.**—Before a "Chuharia" ulcer is formed the patient complains of severe starting and darting pains of neuralgic nature. The parts are to some degree tender. He is attacked with fever of rheumatic nature. After such a duration of fever for 4 or 5 days, certain eruptions, to some eczematous patches, are formed on the skin at the nerve endings. The eruptions gradually suppurate and afterwards several ulcers are formed. The interspaces between the eruptions also become infiltrated and the ulcer gradually becomes enlarged.

**PATHOLOGY.**—I am quite uncertain as regards any of micrococcal or bacterial origin or to the pathological changes thereby. I, therefore, appeal to all interested to perform microscopic examinations after due observations.

##### TREATMENT.

(1) *General.*—Tonics, especially iron, phosphates and arsenic are found efficacious. To some, cod liver oil and iodides are found to do some good.

(2) *Local.*—At first cauterisation of the ulcer with strong carbolic acid is essential. Afterwards antiseptics, iodoform, carbolic oil, etc.—are to be administered. I have found mercury to produce no effect. In extensive parietal ulcers, skin grafting is often necessary.

Yours, etc.,

SUKESLOCHON SEN, I.M.F.,  
Sub-Assistant Surgeon.

#### UREA QUININE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—In reply to Dr. Gillespie's letter I beg to send the following notes for his information:—

For minor operations 2 c.c. of a 1 per cent. solution of quinine urea hydrochloride will suffice. It is non-toxic even



when 5 to 6 c.c. of the strength is given for producing local anaesthesia.

The above strength is contraindicated in operations on the toes and fingers, as well as in circumcision. In these cases there is some risk that the fibrinous exudate thrown around the capillaries, as a result of the injection, may interfere with the terminal circulation and a slough may occur. In such operations it is better to use a weaker solution, say 0.25 per cent.

JESSORE.

Yours, etc.,  
S. N. GUHA.

## UREA QUININE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Information regarding the use of "Urea Quinine" as an anæsthetic, required by Capt. Gillespie, will be found in Martindale and Westcott's Extra Pharmacopœia, 16th Edition, Vol. I, page 647. The following is the copy of the para. :—

As local anæsthetic it is said to be equal to cocaine—the analgesia persists for 4 to 6 hours, even to several days. Was used extensively hypodermically in America for malaria in which marked anaesthesia was noticed at the site of injection—hence its trial as a cocaine substitute. Three to 5 c.c. hypodermically of 1 per cent. solution (up to 3 per cent. is harmless) used in various operations like cocaine; at the same time it acts as a hæmostatic. In 10 to 30 minutes 1 per cent. produces anaesthesia of the part to be incised—it is prolonged for several hours. It is non-toxic almost in any amount, except where idiosyncrasy exists to quinine. Healing of wounds, however, was found to be delayed owing to thickening of edges due to fibrinous exudation, but this all healed in time.

Yours, etc.,  
K. KRISHNA RAO,  
Medical Officer.

## UREA QUININE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—In the November number of the *Indian Medical Gazette* Capt. T. D. W. Gillespie wanted to know "what quantities of quinine urea hydrochloride should be injected hypodermically to produce local anaesthesia," and with regard to your question, I think I can throw some light on the subject.

In the *New York Medical Journal*, 1915, Vol. II, page 708, Amster recommends quinine urea hydrochloride as a local anæsthetic. He has performed 200 serious operations with a freshly prepared solution, containing 0.125 to 0.25 per cent., to which a few drops of 1 to 1000 adrenalin chloride are added. The skin along the whole course of proposed incision is slowly infiltrated and the deeper layers are prepared. Nerves are carefully separated and infiltrated without injuring them.

Complete anaesthesia is proposed in from fifteen to thirty minutes, and lasts an indefinite time, i.e., until the granular fibrin, which is infiltrated in the nerves and tissues, is absorbed.

Leigh F. Wilson, in the *Journal of American Medical Association*, 1915, Vol. II, page 1102, discusses the use of a strong solution (1 to 4 c.c. of 30–50 p.c.) in cases of *Hyperthyroidism*, only to control the symptoms. The skin over the area to be infiltrated is anaesthetised with 0.1 p.c. cocaine or 0.25 p.c. novocaine. The infection is repeated every third day, choosing a fresh site each time. Generally eight to fifteen infiltrations are required to improve the general symptoms. These strong solutions produce extensive inflammatory changes and necrosis of thyroid cells. The injections are almost painless and there is no subsequent discomfort.

B. M. Iwanaw (*B. M. Journal*, Vol. I, p. 640) performed 63 operations under local anaesthesia. The solution was prepared by Messrs. Parke, Davis & Co. in ampoules. Besides the injection he poured some of the fluid over the cut tissue. The operations included *fibromatous cysts, tuberculous glands, glands in the neck, varicose veins, on bones, for removal of shrapnel particles and for hernia*. Injection was made half an hour before operation. The effect of anaesthesia developed in about 10–15 minutes and, as a rule, lasted 2 to 3 days and sometimes several days. It is not injurious.

N. B.—Each ampoule contains 5 c.c. of a 1 per cent. sterile aqueous solution of quinine and urea hydrochloride, supplied in boxes of 6 ampoules.

E. H. (Terrell) Proctologist and Gastro-enterologist, September 1916 abstracted in *The Prescriber*, December 1916, page 262. He advocates solution for injection in strength from one to twenty per cent. according to the age of the *pile* and the amount of the fibrin tissue it contains. Sloughing rarely occurs. The injection is done in the body of a *pile* just enough to slightly distend on each succeeding day until all are treated. Small quantity of a greater strength should be used.

J. R. Garner—*Journal Record, Med.*, May, 1916—uses 10 c.c. of a 1 per cent. solution with excellent results in *sciatica*. The injection is done where the great sciatic nerve emerges from the pelvis through the great sacro-sciatic foramen. A few drops of the solution are injected first into the skin and after a few seconds the needle is pushed into the nerve and the solution is then slowly injected.

Yours, etc.,  
P. O. NORTH LAKHIMPUR. RAJENDRA KUMAR SEN,  
DEJOO TEA CO., LD.

## Service Notes.

WE understand one extra appointment as Colonel I. M. S. has been created in the Lucknow division, the only extra appointment due to the War. It looks like Falstaff's tavern bill, in view of the very considerable increase of the Native Army. Let us hope it is only a beginning.

LIEUTENANT-COLONEL J. W. RAIT, I.M.S., has been granted six months' leave by the India Office Medical Board, with permission to undertake duty in England under the Central Medical War Committee.

THE casualties among officers reported during the fourteen days, 3rd to 16th July inclusive, were again comparatively low—1,341. They are as follows:—

|               |     |     |       |
|---------------|-----|-----|-------|
| Killed ...    | ... | ... | 297   |
| Died ...      | ... | ... | 33    |
| Wounded ...   | ... | ... | 613   |
| Missing ...   | ... | ... | 121   |
| Prisoners ... | ... | ... | 277   |
| TOTAL         |     |     | 1,341 |

The casualties to medical officers would also have been low, but for the loss of the *Llandoverly Castle*. They were 44. The names are given below. All, unless otherwise stated, are temporary officers of the R. A. M. C.

*Killed*.—Captain E. Newton (S. R.).

*Lost at Sea*.—(All Canadians in S.S. *Llandoverly Castle*.) Lieutenant-Colonel T. H. Macdonald; Major G. M. Davis; Captains W. J. Enright, W. A. Hutton, A. V. Leonard; Matron M. M. Fraser; Sisters C. Campbell, O. J. Douglas, A. Dussault, M. Follette, M. J. Fortescue, M. K. Gallaher, J. M. McDiarmid, M. A. Mackenzie, R. Maclean, M. Sampson, G. I. Sarc, A. I. Stammers, J. Templeman.

*Died*.—Lieutenant-Colonel W. M. McCall, D.S.O. (T. F.); Surgeon E. J. G. Sargent (R. N.); Captains G. R. Ellis (T. F.), R. N. Wallace (T. F.), J. Anderson, R. A. Sillar (Australians); Lieutenant L. F. Jamieson.

*Wounded*.—Lieutenant-Colonel A. H. Moseley, D.S.O. (Australians); Major G. F. Timpson (T. F.); J. A. Pridham, M.C.; Captains W. M. Cameron, W. F. Shanks, E. S. Outhbert, H. M. Drake, F. H. Goss; Lieutenant W. H. Gross.

*Missing*.—Captain W. A. Rees.

*Prisoners of War*.—Captains G. L. Jones, R. M. Coalbank, J. M. Mackenzie, M.C., R. H. Green, H. S. Moore, A. G. Clark; Lieutenant J. Findlay.

Surgeon Edward John Godingate Sargent, R.N., was reported as having died on service, in the casualty list published on 1st July, 1918. He was educated at St. Bartholomew's Hospital, and qualified as L. M. S. S. A. in 1917, after which he took a temporary commission in the Royal Navy.

Captain Edward Newton, R.A.M.C., previously returned as missing, was reported as killed, in the casualty list published on 2nd July, 1918. He was educated at Cambridge and at St. George's Hospital, and took the M. R. C. S. and L. R. C. P. London in 1916. After qualifying he joined the Special Reserve of the R. A. M. C. as a Lieutenant, and was promoted to Captain after a year's service.

Captain James Tennant Whitworth Boyd, Canadian Army Medical Corps, died of nephritis, on 16th June, 1918, aged 27. He was the son of the Revd. Andrew Boyd of Port Arthur, Ontario, was born at Glenlog, Nova Scotia, and educated at the Queen's University, Kingston, where he graduated as M. B. and C. M. in 1914. After serving for a year in the Kingston General Hospital, he joined the Canadian A. M. C., came to Europe in February, 1916, and served with No. 7 Canadian General Hospital (Queen's University Unit), at Etaples. In February, 1917, he was invalided to England, and for the past fifteen months had been a member of the Laboratory Staff of the Kitchener Hospital.

Captain William Fraser Hale, Canadian Army Medical Corps, who died in June, 1918, of accidental injuries, was the son of the Revd. Joseph Hale, of Louisburgh, Nova Scotia, and was born at Springhill, Nova Scotia. He was educated at Baltimore University, graduating in 1902, and joined the Canadian A. M. C. in January, 1917.

Captain R. A. Sillar, Australian Army Medical Corps, was reported as having died on service, in the casualty list published on 13th July, 1918.

Captain George Reginald Ellis, R.A.M.C., (T. F.), died at Chedworth, Gloucestershire, in June 1918, of illness contracted on active service. He was educated at Sherborne School, where he was in the Rugby fifteen, and at Durham University, where he graduated as M. B. and B. S. in 1907, afterwards succeeding to his father's practice at Bishop Auckland, Durham, where he held the appointment of Honorary Surgeon to the Lady Eden Hospital. He was a member of the staff of the 2nd Northumbrian (Darlington) Field Ambulance, in which he attained the rank of Captain on 3rd December, 1912, and had served in France, Flanders, and Macedonia.

Captain Robert Neilson Wallace, R.A.M.C. (T. F.), died at Colchester, on 5th July, 1918. He was educated at Edinburgh University, where he graduated at M. B. and Ch. B. in 1907, and after filling the posts of Clinical Assistant in the ear, nose, and throat department at Edinburgh Royal Infirmary, of House Surgeon of Bradford Royal Infirmary, and of Senior Medical Officer of the Manchester Children's Hospital at Pendlebury, went into practice in Edinburgh. He held a Commission in the 6th Territorial Battalion of the Royal Scots, in which he attained the rank of Captain on 19th March, 1910.

Lieutenant-Colonel William McCall, R.A.M.C. (T. F.), was reported as having died on service, in the casualty list published on 10th July, 1918. He was educated at Glasgow University, where he graduated at M. B. and C. M., 1892, after which he went into practice in Birmingham. He held a Commission in the 1st South Midland (Birmingham) Field Ambulance, in which he attained the rank of Major on 26th August, 1914, and had been promoted to Lieutenant-Colonel during the war.

Lieutenant L. F. Jamieson, R.A.M.C., was reported as having died on service, in the casualty list published on 10th July, 1918. He took a temporary Commission in the R. A. M. C. towards the end of 1917.

Captain J. Anderson, R.A.M.C., died at Fort Sandeman, Baluchistan, on 17th May, 1918, after a short illness.

The Canadian Hospital Ship *Llandovery Castle*, a former Union-Castle liner, was torpedoed and sunk in the Atlantic by a German submarine on the night of 27th June. She had a total complement of 258 on board, including seven officers, fourteen nurses, and 63 rank and file of the Canadian Army Medical Corps. One boat was picked up, with 24 survivors, including Major Lyon, Canadian A. M. C. A later telegram announced that one more survivor, Captain G. S. Sills, Canadian A. M. C., had been picked up by a west-bound steamer. The *Llandovery Castle* was returning empty from Canada to Europe, so had no wounded on board at the time. The names of the staff, all of whom have been lost but Major Lyon and Captain Sills, are as follows:

**Officers.**—Lt.-Col. T. H. Macdonald, Majors G. M. Davis and T. Lyon, Captains W. J. Enright, W. A. Hutton, A. V. Leonard, and G. S. Sills, Captain and Chaplain D. G. Macphail.

**Nurses.**—Matron M. M. Fraser, Sisters C. Campbell, C. J. Douglas, A. Dussault, M. Follette, M. J. Fortescue, M. K. Gallaher, J. M. Macdiarmid, M. A. Mackenzie, R. Maclean, M. Sampson, G. I. Sare, A. I. Stammers, J. Templeman.

DR. JOHN ALBERT MADDOX, Burma Uncovenanted Medical Service, died in the General Hospital, Rangoon, on 19th May, 1918, aged 59. He took the L. R. C. P. Edin. and L. R. C. S. Edin. in 1883, and after serving for some time in the coolie emigration, was appointed to the Burma Service in 1891. He had held the post of Civil Surgeon in many districts, and should have retired in 1914, on attaining the age of 55, but continued to serve, owing to the war.

THE casualties among officers reported during the fourteen days, 17th to 30th July, 1918, inclusive, were again low, totalling 1,086. They are tabulated as follows:—

|               |     |     |     |
|---------------|-----|-----|-----|
| Killed ...    | ... | ... | 275 |
| Died ...      | ... | ... | 43  |
| Wounded ...   | ... | ... | 461 |
| Missing ...   | ... | ... | 93  |
| Prisoners ... | ... | ... | 214 |

TOTAL ... 1,086

The casualties among medical officers were also the lowest reported for a long time, 21 in all. The names are given below. All, unless otherwise stated, are temporary officers of the R.A.M.C.

**Killed in action.**—Captains E. P. W. Wedd, R. M. MacLachlan; Surgeon Probationer J. J. A. Lord-Flood (R. N. V. R.).

**Died.**—Sister A. J. Ross (Canadians).

**Wounded.**—Captains J. M. Forsyth, M.C., G. A. Russell (Canadians), A. J. Sprey-Vanger (South Africans), F. W. Schofield; Lieutenants F. S. Adamson, S. Riddiough;

Surgeon-Probationer H. S. Savage (R. N. V. R.); Sister M. Wright.

**Prisoners of War.**—Lt.-Colonel H. B. Kelly, D.S.O. (Regimental R.A.M.C.); Major F. G. Lescher, M.C.; Captains A. C. Hepburn, W. J. Hirst (T.F.), W. G. Harnett, E. H. Griffin, D.S.O., M.C., W. F. Dunlop; Lieutenants A. S. Findlay and G. V. W. Anderson.

Captain Edward Parkey Wallman Wedd, R.A.M.C., was killed in action instantaneously on 13th July, 1918, aged 34. He was the elder son of E. A. Wedd, J.P., of Great Wakering, Essex, and was educated at Cheltenham College, where he was stroke of the College boat in 1901, at Cains College, Cambridge, where he gained his blue, rowing against Oxford in 1905, and graduated as B. A., in 1906, and at St. Bartholomew's Hospital. He took the M.R.C.S. and L.R.C.P., London, in 1911, and afterwards acted as House Surgeon of the West London Hospital. When the war began, he held a commission in the Yeomanry, went to the front in November, 1914, and had served there ever since. After serving on the staff for some time, he took a temporary commission in the R.A.M.C. in 1917, and received the Military Cross in April, 1918.

Captain P. M. MacLachlan, R.A.M.C., was reported as having died of wounds, in the casualty list published on 18th July, 1918.

Captain George Luther Sills, Canadian Army Medical Corps, whose name was published in the list of missing in the *Llandovery Castle* on 27th June, 1918, was born at Tweed, Ontario, on 14th March, 1888, and educated at Kingston University, Ontario. As a student, he joined the C. A. M. C. as a private, and served overseas for a year in the 5th Stationary Hospital and in the 7th General Hospital. He returned to Canada in April, 1916, and graduated the same year. He returned to Europe as a Captain in the C. A. M. C., in March, 1917. He was not among the twenty-four survivors in one boat, who were picked up. A subsequent telegram stated that he had been picked up by a west-bound vessel, and landed in America; but, as his name was officially published as missing, this appears not to have been confirmed.

DR. HENRY HEARSEY BATHURST died at Southampton on 21st July, 1918, aged 67. He was educated at St. Bartholomew's Hospital, took the M. R. C. S. in 1874, and shortly after entered the service of the East Indian Railway, in which he spent about thirty years, retiring some twelve years ago. For a long time he was stationed at Asansol.

LIEUTENANT-COLONEL THOMAS HOWARD MACDONALD, Canadian Army Medical Corps, lost in the *Llandovery Castle* on 27th June, 1918, was born at Port Mulgrave, Nova Scotia, on 15th December, 1877, and educated at Bellevue Hospital Medical College, New York, where he graduated in 1900, after which he went into practice at Port Hawkesbury, Nova Scotia. Before the war he held the rank of Major in the Canadian Militia. He came overseas in December, 1915, and served in France with the Canadian Forces from August, 1917, to March, 1918, when he was appointed to the Command of the *Llandovery Castle*.

Major Gustavus Mitchell Davis, Canadian Army Medical Corps, lost in the *Llandovery Castle* on 27th June, 1918, was born at York, Ontario, on 8th January, 1874, and educated at Toronto University, where he graduated in 1901. He was in practice at Welland, Ontario, came overseas with the 1st Canadian Contingent in September, 1914, and went to France in May, 1915. He served with the 5th Canadian Battalion at the Battle of Festubert, and was afterwards Medical Officer of King Edward's Horse. On 11th April, 1917, he was promoted to Major, and appointed to the Hospital Ship *Letitia*, and was on board when she was wrecked on the coast of Nova Scotia, in August, 1917. Afterwards he served successively on the *Araguaya* and the *Llandovery Castle*.

Major William James Enright, Canadian Army Medical Corps, lost in the *Llandovery Castle* on 27th June, 1918, was born at Port Daniel, Quebec Province, in February, 1873, and educated at Laval University, Quebec, where he graduated in 1897. He went to France as Registrar and Adjutant of No. 8 Canadian General Hospital, with which he served till sent to England sick in March, 1918. He was making his first trip on the *Llandovery Castle*.

Captain Arthur Vincent Leonard, Canadian Army Medical Corps, lost in the *Llandovery Castle* on 27th June, 1918, was born at Warkmouth, Ontario, on 29th October, 1889, and educated at Toronto University, where he graduated in 1911. He came overseas in September, 1915, went to France in November, 1915, and remained there till October, 1917. In December, 1917, he was appointed to the *Araguaya*, and in March, 1918, to the *Llandovery Castle*.

Captain Frank Metcalfe, R.A.M.C. (T.F.), of Newcastle-on-Tyne, died in the Framlington House Hospital for Officers on 10th July, 1918, aged 26. He was educated at Durham University, where he graduated as M. B. and B. S., in 1914, and in August, 1914, took a commission as Lieutenant in the 1st Northumbrian Field Ambulance, with which he went to

France in April, 1915. He was invalided in September, 1916, with leukaemia, from which he apparently recovered, and rejoined duty in April 1917, returning to France, at his own request, in August, 1917. He was in the retreat on the Somme in March, 1918, after which his health again broke down.

Surgeon-Probationer J. J. A. Lord-Flood, R.N.V.R., was reported as killed in action, in the casualty list published on 25th July, 1918.

ON the transfer of Lieutenant-Colonel A. Leventon, I.M.S., to the Campbell Medical School, Sealdah, Calcutta, Lieutenant-Colonel E. C. Macleod, I.M.S., from Sibsaigar was transferred to the charge of Lakimpur District and the Berry-White Medical School at Dibrugarh.

CHARGE allowances for Medical Officers employed with Field Ambulances and Stationary and Clearing Hospitals.

It has been decided—

(1) that the term "stationary hospital" in Army Department letter No. 14163, dated 20th September, 1917, and the term "field ambulance or clearing hospital" in paragraphs 13 (d) and 154, Army Regulations, India, Volume I, should be held to include all classes of such medical units, whether British, Indian or Combined; and

(2) that a clearing hospital will be regarded as equivalent to a field ambulance for purposes of staff pay admissible under Army Department letter No. H-636, dated 26th January, 1916, and Army Instruction (India) No. 207 of 1918.

APPOINTMENT of an Assistant Director, Medical Services, Bangalore Brigade, and an Assistant Director, Medical Services, Southern Brigade:—

Sanction is accorded to the following arrangements, with effect from the date of this Instruction, and for the remaining period of the war:—

(a) The present Assistant Director of Medical Services, Bangalore and Southern Brigades, to be Assistant Director of Medical Services, Bangalore Brigade, with the office establishment already authorised for the combined Brigades.

(b) An Assistant Director of Medical Services to be appointed to the Southern Brigade and located at Wellington, with the following office establishment:—

|                          |                            |
|--------------------------|----------------------------|
| One military staff clerk | ... on Rs. 140 per mensem. |
| One soldier clerk        | ... on Rs. 20 " "          |
| One soldier clerk        | ... on Rs. 15 " "          |
| One peon                 | ... on Rs. 10 " "          |

GRANT of horse allowance in certain circumstances to Captains and Lieutenants of the Royal Army Medical Corps and the Indian Medical Service:—

It has been decided that provisions of Army Regulations, India, Volume I, paragraph 277, shall be extended to cover the cases of Captains and Lieutenants of the Royal Army Medical Corps and Indian Medical Service who are employed with mobilized field medical units in India but have not received orders to hold themselves in readiness to proceed on field service. This decision is subject to the following conditions:—

(1) that the General Officer Commanding the Division in which an officer is serving considers the maintenance of a horse necessary for the performance of his duties;

(2) that a horse is actually maintained;

(3) that a Government charger is not supplied.

2. The expenditure involved should be debited to the ordinary grant and head of account, leaving it to the Central War Controller to make necessary re-adjustments between His Majesty's and Indian Governments, except in the case of units mobilized for service in connection with North-West Frontier requirements when the expenditure should be debited to "War India—North-West Frontier, 1916."

SUBJECT to His Majesty's approval, Reginald Anthony Murphy, temporary Lieutenant of the Indian Medical Service, is permitted to resign the service, with effect from the 12th July, 1918.

MAJOR-GENERAL WILLIAM BURNET BANNERMAN, C.S.I., M.D., K.I.P., Madras, is permitted to retire from the service, subject to His Majesty's approval, with effect from the 6th July, 1918.

THE date of retirement of Lieutenant-Colonel Henry Albert John Gidney, F.R.C.S.E., should be 26th July, 1918, and not 1st July, 1918, as notified in Army Department Notification No. 1464, dated the 28th June, 1918.

#### INDIAN MEDICAL SERVICE.

THE following promotion is made, subject to His Majesty's approval, with effect from the date specified:—

To be Major-General.

Lieutenant-Colonel Gerald Godfray, C.S.I., vice Major-General W. B. Bannerman, C.S.I., M.D., K.I.P., retired, with effect from the 6th July, 1918.

THE undermentioned to be temporary Lieutenants, subject to His Majesty's approval, with effect from the dates specified:—

Bamanji Pestanji Daruwala, 22nd July, 1918; Kala Sahai Nigam, 31st July, 1918; Murli Monohar, 1st August, 1918; Bantwal Panduranga Baliga, 4th August, 1918; Vishwanath Hari Bedekar, 8th August, 1918; Gopal Chandra Ray, 7th August, 1918; Dadabhoy Barjorji Dector, 7th August, 1918; Mohamed Ajmal Hunsain, 9th August, 1918; Coimbatore Venkatramanayar Krishnaswami, 11th August, 1918, and Dara Hermasji Bharucha, 11th August, 1918.

MAJOR H. M. MACKENZIE, M.B., I.M.S., is appointed to be Professor of Pathology, Medical College, Lahore, with effect from the date on which he assumes charge of that office.

CAPTAIN J. A. SHORTEN, M.B., I.M.S., Resident Medical Officer, Medical College Hospitals, Calcutta, is appointed to officiate as Professor of Physiology, Medical College, Calcutta, in addition to his own duties, with effect from the 1st July, 1918, until further orders. During the period Major D. McCay, I.M.S., acts for Lt.-Col. B. Deare, on leave.

LIEUTENANT-COLONEL H. BURDON to be acting Colonel subject to His Majesty's approval, under the provisions of Army Instruction (India) No. 62 of 1918, from the 24th December, 1914, to 2nd March, 1916.

CAPTAIN RICHARD EDWARD FLOWERDEW, M.B., is granted, subject to His Majesty's approval, the temporary rank of Major while holding the appointment of Deputy Assistant Director, Medical Services (Sanitary), Derafat, Bannu, Kohat and Multan Brigades. Dated 1st August, 1918.

## Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, The Indian Medical Gazette, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 14, including postage, in India. Rs. 16, including postage, abroad.

#### BOOKS, REPORTS, &c., RECEIVED:—

Sir J. Barrett. The Twin Ideals. 2 vols. H. K. Lewis & Co.  
Aids to Diagnosis. Baillière, Tindall & Cox.  
Clinical Case-taking. Baillière, Tindall & Cox.  
Bombay Health Report.  
Lahore Health Report.  
Bengal Sanitary Report.  
Pasteur Institute Report, Kasauli.  
Pasteur Institute Report, Assam.  
H. K. Kong Medical Report.  
Siam Anti-Hookworm Report.

#### LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

Dr. Carthews, Siam; Capt. Reader, R.A.M.C., Bombay; Capt. Sowell, I.M.S., Cairo; Lieutenant-Colonel Hasall Wright, I.M.S., Coorg; Assistant Surgeon Dyal Singh, Raera; Dr. Chatterjee, Calcutta; Capt. Finny, R.A.M.C., Bagdad.

